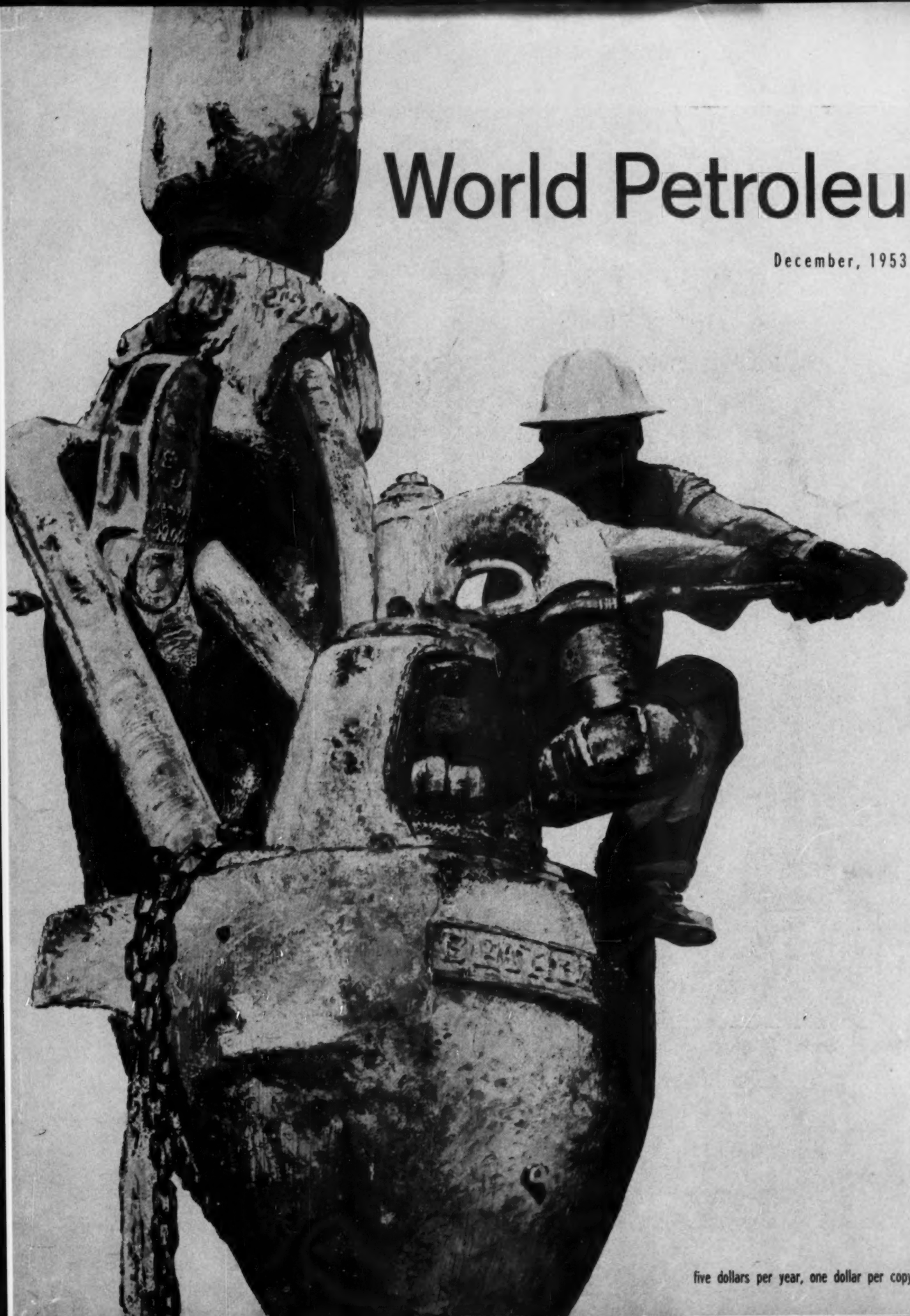
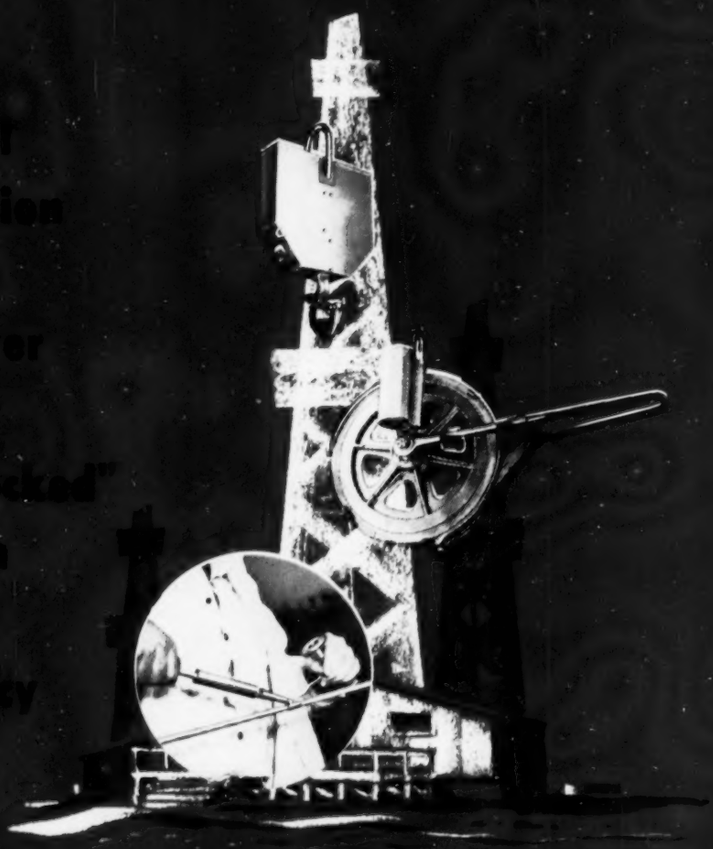
World Petroleum

December, 1953



five dollars per year, one dollar per copy

it takes real precision instruments to deliver Lane-Wells "triple-checked" depth measurement accuracy



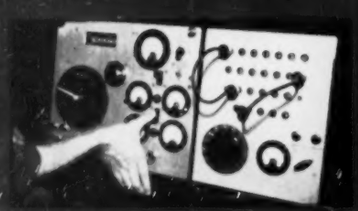
It may be a little difficult to think of cables and sheaves as "precision instruments," but those used in Lane-Wells perforating are just that — for the following reasons:

Every one of Lane-Wells armored **conductor cables** is flagged and individually calibrated. Its variations under load and depth are accurately charted and recorded. Using the stretch figures for the cable which is being used, the perforating operator can really pin-point the position of the gun.

Each **measuring sheave** over which the cable runs has a built-in micrometer adjustment to compensate for even the slightest wear, guaranteeing continuous accuracy of the rim of the sheave.

The **weight indicator** is built around a precision-formed helical spring whose performance characteristics have been accurately determined by repeated tests, and which is sensitive to the slightest variation in load.

Working with precision instruments like these, it's no wonder that Lane-Wells depth measurement accuracy is conceded to be "the standard of the industry"!



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What's NEW

In Perforating, Logging, and Fishing Tool Services

Latest News About New Tools, Techniques and Services

More Oil Flows...

13 B/D to 158 B/D

Well previously perforated by other make bullets and jets without increasing production. After 32 holes shot by improved McCullough Standard Glass Jet, production increased to 158 B/D. Casing: 7", 20 lb. cemented. Depth: 3400 feet.

Through Cleaner, Deeper Holes...

Peak Production of 60 B/D had dropped to 20 B/D over a period of years. Well perforated with 1314 improved McCullough M-3 Burrless Bullets, between 6234 and 6544 feet. Casing: 7", 26 lb. cemented.

20 B/D to 100 B/D

Made by Improved McCULLOUGH Perforators...

0 B/D to 360 B/D

Offset well. 360 B/D through four ½" test holes between 5203 and 5204 feet, shot with improved McCullough M-3 Burrless Bullets through 5½", 15½ lb. cemented casing. Well completed with 38 Super Glass Jets and 38 M-3 Burrless Bullets for production of 408 B/D, without acidizing. Neighboring wells had to be acidized to produce.

Now 25% Deeper Penetrating!

If you don't have a copy of "How To Get More Oil," write for yours today, or ask your McCullough Service Engineer. Thirty-two pages of usable perforating data to help you "Get More Oil."

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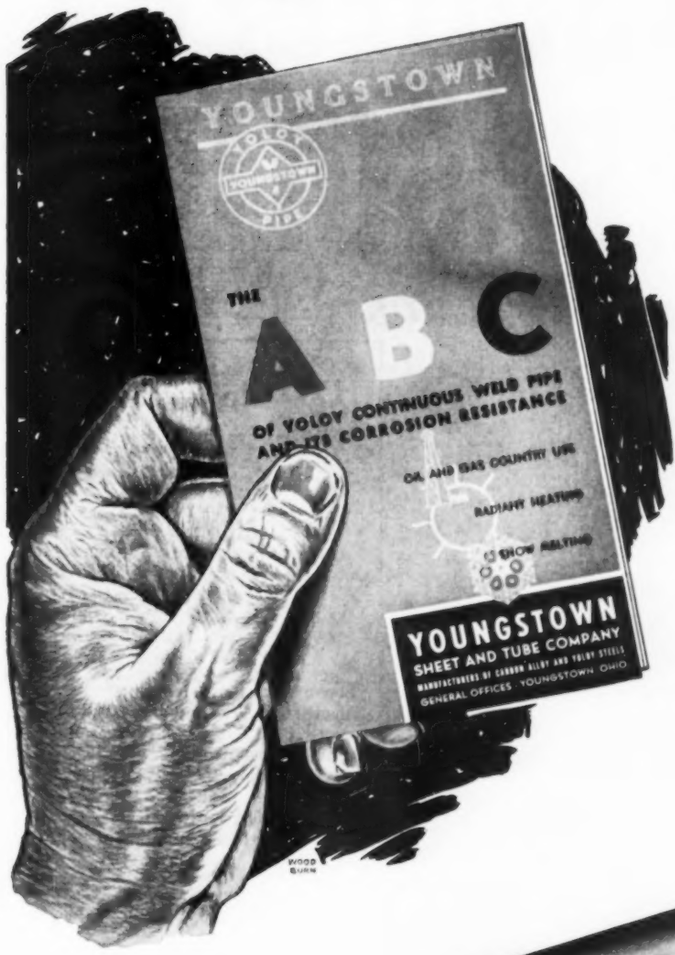
This **DATA** *may solve* **YOUR** *piping problem*



● Here is the up-to-date story of Yoloy Continuous Weld Pipe—a remarkable low alloy steel whose nickel-copper content gives it unique ability to withstand corrosion, abrasion and shock. These outstanding advantages combined with high strength, ductility and weldability make Yoloy Pipe an excellent selection.

Proved by 18 years of satisfactory performance, Yoloy is highly recommended by users in such service as radiant heating, snow melting, gas line gathering, brine lines and other industrial piping.

This new folder presents the facts and figures on Yoloy's physical and chemical properties, with data on sizes now available and other information you'll need to select Yoloy Continuous Weld Pipe to meet your special requirements. Write for a copy today.

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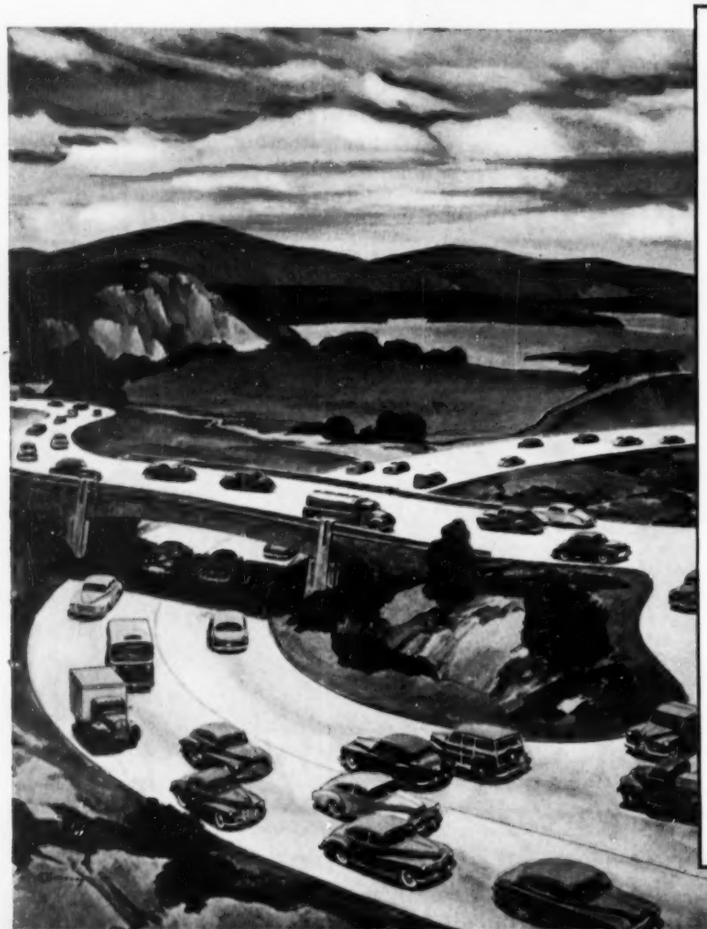
How Flying Red Horse Research

SQUEEZES MORE GASOLINE

from Every Barrel of Crude . . .



to Help Supply the Nation's Million More Motorists Every Year!

THERE ARE over 43 million cars on the road—and they keep increasing at the rate of a million a year. Where is the gasoline coming from to supply this ever-growing number of motorists—and to meet the needs of industry and national defense?

Socony-Vacuum is helping supply the answer by *squeezing more gasoline* from every barrel of crude through improved catalytic refining processes. These new processes make it possible to produce high-quality blending stocks from any crude oil, thus making available greater amounts of higher octane gasoline.

Here are the facts . . . In 1945 Socony-Vacuum obtained a gasoline yield of 39% from a barrel of crude. Today 18% more gasoline—of 40% better performance—is obtained from each barrel . . . enough gasoline daily to take care of 1,100,000 additional cars from the same amount of crude oil.

Flying Red Horse research like this assures Mobilgas dealers a constant, plentiful supply of America's favorite gasoline brand!

SOCONY-VACUUM

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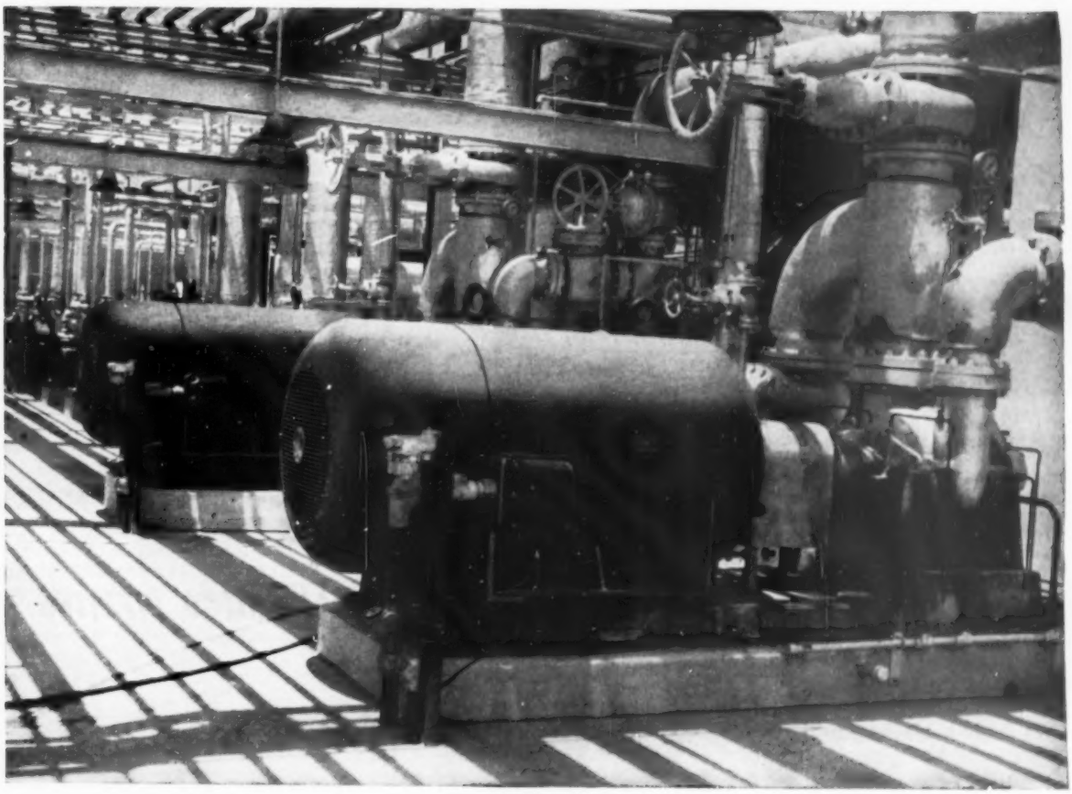
REFINERY BENEFITS YOU CAN COUNT ON



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Available in accepted industry standards, G-E totally-enclosed motors can do your hard jobs for you safely, efficiently. See your G-E representative for information. Or write for FREE catalogue GEA 4400A to: International General Electric Co., 570 Lexington Ave., New York 22, N. Y., U.S.A. 1A-52-7E

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G-E explosion and dust-explosion-proof motors are built specifically for use in these hazardous locations. Carefully machined flame paths, non-sparking Textolite fan insure this safety.

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- Dirt-Barring Labyrinth Seal

You Can Put Your Confidence In—

GENERAL ELECTRIC

How THE NATION'S LEADING PIPELINES USE

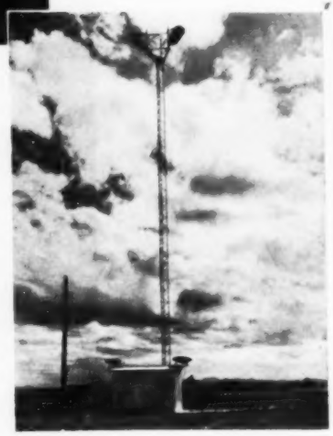
PHILCO *MICROWAVE*

Philco Microwave is being used daily by the Nation's leading pipeline companies. These pipeline companies have selected microwave because: (1) it is an economical, reliable and expandable communications system eliminating costly and vulnerable wire lines, and (2) it provides them with private, dependable communications over long distances, cutting maintenance costs to a minimum.

Pipelines stretching over hundreds of miles can be operated and controlled from a single point by microwave. Pressure, rate of flow and tank level readings can be recorded automatically and relayed to headquarters or various points along the route. Philco Microwave carries telephone, teletype, control and telemetering channels . . . *and offers complete tie-in with VHF two-way radio systems and existing wire line facilities.*

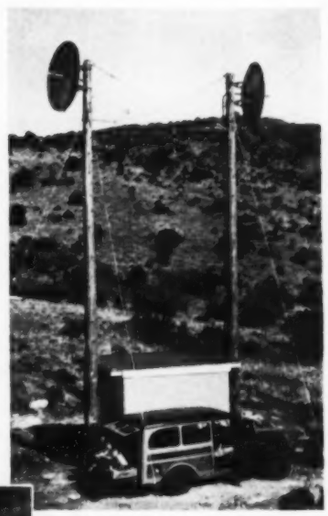
Shown here are two of the many Philco Microwave systems that provide the nation's leading pipelines with modern and efficient communications.

From this central console headquarters at Kansas City, Missouri the entire Platte pipeline and communication system can be controlled and monitored.

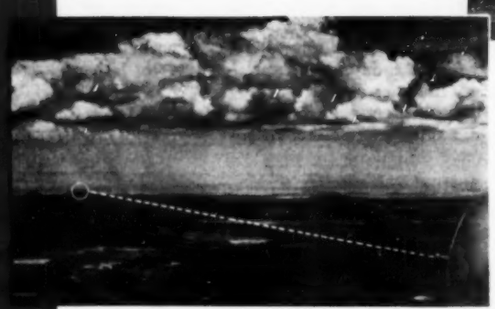


Platte Pipe Line Company's microwave system is over 1000 miles long . . . to provide every communication and control facility: voice channels, remote supervisory control, continuous or selective telemetering, teletype, alarm signaling and VHF radio. This entire microwave system was surveyed, designed and installed by Philco.

TYPICAL PHILCO PIPELINE INSTALLATIONS

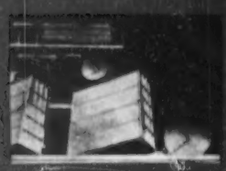


El Paso Natural Gas Company has 500 miles of Philco Microwave with an average distance of 50 miles between stations. This New Mexico to Arizona system consists of repeater and terminal stations, multiplexing equipment for system party line and VHF radio channels.



The longest microwave hop in the nation is this 81-mile El Paso hop from Mount Elden to Dilkon, Arizona . . . typical of the utilization of terrain advantage by Philco.

OTHER INDUSTRIES USING PHILCO MICROWAVE



Communication companies use Philco Microwave for telephone, telegraph and television transmission. Reliability, economy and quality of transmission make Philco Microwave ideal for their use.

Philco Microwave is being used by leading railroads for telephone, telegraph and train dispatching. Microwave is a private system, saves costly wire installations and simplifies right-of-way problems.

Utilities rely on Philco Microwave for the control of power stations, dispatching of repair trucks and communication. Dependable channels, unaffected by adverse weather, are a necessity for utility use.

For complete details write to Dept. [illegible]

PHILCO *Symbol of* QUALITY

PHILCO CORPORATION

GOVERNMENT & INDUSTRIAL DIVISION PHILADELPHIA 44, PA.

WHY PHILCO MICROWAVE is IDEAL for PIPELINES

• RELIABILITY

Philco leads the industry in the supply of microwave equipment. It is the choice of industry and the Armed Forces . . . and for good reason. Joint Army-Navyspecified components are used wherever applicable. Philco "Power House" klystrons have remained in operation for more than 20,000 hours in many installations. Highest quality components plus dependable design assure long, trouble-free operation.

• ECONOMY

Philco Microwave is designed to operate at lowest cost. Shelter-mounted antennas and tower reflectors eliminate costly, power-consuming feed lines. Philco equipment design provides the highest power output, insuring reliable, low cost communication over the longest hops.

• FLEXIBILITY

Philco Microwave design permits future expansion of facilities by the simple addition of pre-packaged, pretuned subassemblies. Each of the 24 voice channels in Philco multiplexing equipment is capable of being subdivided into 16 additional channels for telemetering, teletype, supervisory control and other uses. Convenient tie-in to existing wire or VHF facilities greatly increases utility.

• ACCURATE SURVEYS

The first step to reliable, economical microwave communications is an accurate right-of-way survey. Philco Survey Engineers have broad experience in microwave surveys and will plan your microwave system for your present and future needs at the lowest possible cost.

• SYSTEMS PLANNING SERVICE

Philco has an experienced systems planning group for consultation and assistance to aid in tailoring a microwave system to meet your specific needs. These engineers will recommend dependable, low cost microwave systems that incorporate flexibility for future expansion. This service covers entire systems including associated equipment such as control consoles, telemetering, teletypewriters, telephones, VHF radios, and other types of equipment.

• INSTALLATION, MAINTENANCE AND TRAINING

Philco can install or supervise the installation of your entire microwave system and maintain your system during initial operation. Philco can also train your personnel as they have trained thousands of technicians and maintenance men in the operation of its equipment. Only Philco can give you an operating microwave system complete with every necessary equipment and service. Write today for full information.

Washington PIPE LINE

By Joseph Huttlinger

SHIFT FROM A WARTIME TO A PEACETIME agency to handle oil and gas is set to go like this:

The Petroleum Administration for Defense will go out of business, and an Oil and Gas Division of the Interior Department will take its place.

Felix Wormser, assistant secretary of the Interior, is to oversee the new agency. He likes oil and gas, and is strong at the White House. He was at Columbia University during the Eisenhower presidency.

Hugh A. Stewart of Denver, formerly of The Texas Company and head of the OGD prior to PAD, is the probable selection to head up the new agency.

Most of PAD's defense powers will be transferred to the new agency. Thus, OGD would be able to manage the industry's voluntary agreement on foreign oil supply, recommend rapid tax amortizations and push for more avgas capacity. The new agency would prepare revised reviews of supply-demand for oil in event of war.

A staff of 40 to 50 is planned, with divisions on program, refining and foreign operations. At its peak, PAD had 350 on its staff.

A MILITARY PETROLEUM ADVISORY BOARD made up of oil executives may be set up once again, to confer on supply matters with the military.

Bruce K. Brown, president of Pan-Am Southern Corp., New Orleans, was head of the previous board until it was merged into the PAD. He does not want the post again. A. P. Frame, vice-president, Cities Service Oil Co., may be drafted for the post.

National Petroleum Council, composed of oil and gas executives, in masterminding the shift from defense to peace agency.

A DESPERATE NEED FOR OIL IMPORTS TO THE United States only a few years off is foreseen by Eugene Ayres, technical assistant to the executive vice-president of the Gulf Research and Development Corp.

By 1960, he believes, we shall be unable to import all the oil we need because of the competitive needs of the rest of the world. By 1970, we shall want to import 4.5 billion barrels, while the world shortage will be nearly four billion; and by 1980, we (and the world) will have around seven billion barrels per annum less than we need.

The true impact is seen when it is realized that 4.5 billion barrels of imports a year by 1970 is equal to more than 12 million barrels daily, just 12 times higher than today's oil imports.

OIL IMPORTING COMPANIES OVERPAID THE government a total of $36 million on tariffs during 1951 and most of 1952, it is indicated in an opinion of the U.S. Customs Court in New York.

In a test case, a refund of $6,500 was ordered to be paid to the Metropolitan Petroleum Corp. Other companies may be eligible for substantial refunds. To be eligible for a refund, an oil importer must have filed a protest within 60 days of an import transaction. As the tariff was presumed legal, much of the tariff was paid without protest.

Illegal, said the court, was the tariff rate that came when the Venezuelan agreement was substituted for the Mexican agreement, effective January 1, 1951. It prevailed until October 1952, when the present lower duties went into effect.

The Mexican agreement had provided for a tariff of 10.5 cents a barrel for petroleum and some products, but the Venezuelan agreement provided for this duty on only about a third of a year's imports. After that, the duty went to 21 cents a barrel.

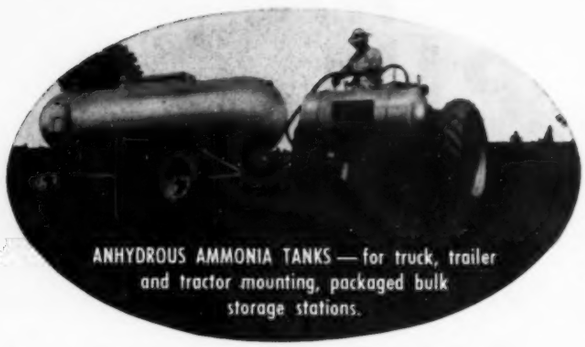
The customs court, in a unanimous opinion of three judges, ruled that the President has authority to change tariffs by executive action only to a maximum of 50 percent. Since the 21 cents was illegal, the court said the 10.5 cent tariff was the one legally in force.

THE CONSUMER CAN PAY FOR HIS GASOLINE pretty near what he wants if he is free to pick the country he'll live in, for the price ranges from 9.2 cents a gallon in Lima, Peru, up to 80.6 cents in Karachi, Pakistan.

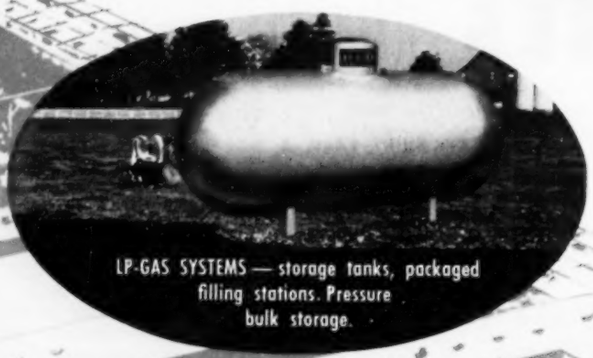
The price includes all taxes and duties which often are the greater part of the cost. Thus, Italy charges a record 52 cents duty and tax, so the consumer pays 77.4 cents a gallon. In Russia, the price (converted into dollars) is 29 cents, about the same as the price in the United States.

This information has been compiled by the U. S. Bureau of Mines into a booklet based on prices in effect as of the middle of the year.

PACKAGED COMPRESSOR PLANTS — for field gas gathering and boosting, flare gas collection, gas lift and repressuring.



ANHYDROUS AMMONIA TANKS — for truck, trailer and tractor mounting, packaged bulk storage stations.



LP-GAS SYSTEMS — storage tanks, packaged filling stations. Pressure bulk storage.

TRANSPORTS — for L-P Gas and anhydrous ammonia.

CAST STEEL FITTINGS — flanged, screwed, refinery return bend, and pipeline flanges.

PACKAGED LP-GAS STATIONS — for servicing vehicles which use butane or propane for fuel.

PRESSURE STORAGE TANKS — for storing of butane, propane, anhydrous ammonia and other liquefied gases.

SINCE 1918

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PETROLEUM CHEMICALS DIVISION

NEWS

December ★ One of a Series of Interest to the Petroleum Industry ★ 1953

Use of Antioxidants Cuts Sweetening Costs

With operating costs continuing to rise and the consumer gasoline market becoming more competitive every day, you are probably looking for every possible opportunity to cut production costs—without sacrificing quality.

The use of antioxidants for sweetening offers just such an opportunity. If you are starting from scratch, the initial cost is low because a minimum of equipment is required to set up the operation. Or, if you employ existing equipment, the cost of revamping is exceedingly low since antioxidant sweetening is a simple procedure.

Operating costs are lower, too, because the use of Du Pont Antioxidant No. 22 reduces regeneration expenses and the need for additional chemicals.

Other Advantages

Since antioxidant sweetening does not require the use of sulfur or copper, the chance of contamination from these elements is eliminated – unless the gasoline comes in contact with them in some other way.

And since Du Pont Antioxidant No. 22 is highly effective as a stabilizer, you can combine two important steps into a single, inexpensive operation when you use this additive as a sweetening agent.

No Gasoline or Octane Loss

Some sweetening methods result in a definite loss of gasoline or octane number. But there is no loss of either product or quality when Du Pont Antioxidant No. 22 is used in the sweetening process.

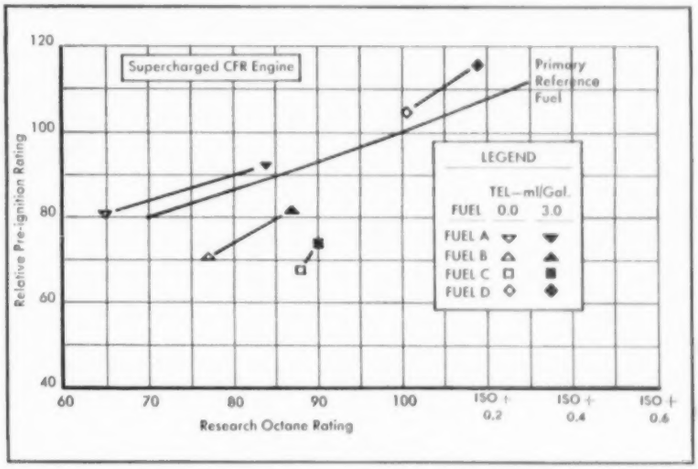
Du Pont Antioxidant No. 22 is N:N'-di-secondary butyl-para-phenylenediamine. Samples of it and additional information on antioxidant sweetening are available through any Du Pont Petroleum Chemicals Division district office.

You can reduce both knock and pre-ignition with one additive

Recent tests at the Du Pont Petroleum Laboratory show that TEL not only inhibits the reactions leading to knock, but also the reactions causing pre-ignition

With the compression ratios of automobile engines steadily rising, the problem of finding methods to eliminate or suppress pre-ignition is becoming increasingly important to the petroleum industry.

To help refiners solve this problem, extensive research in pre-ignition is now being done at the Du Pont Petroleum Laboratory. Much useful information has already been developed.



This chart shows the increased resistance to knock and pre-ignition due to the addition of tetraethyl lead in several fuels.

So far, the solution to the problem has been sought in the following two ways:

1. Reducing the tendencies of combustion chamber deposits to glow and cause surface ignition of the charge.

2. Improving the ability of fuels to withstand ignition by such hot surfaces.

Reducing Glow

Certain additives reduce deposit glow and therefore offer one solution to the problem. However, as engine compres-

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OVER

PETROLEUM CHEMICALS DIVISION
NEWS

CONTINUED *Pre-ignition*

sion ratios are increased still further, it may also be necessary to increase the pre-ignition resistance of the fuels themselves.

Resistance of Fuels

Some hydrocarbons have a greater tendency to be ignited by hot deposit particles than others. Preflame reactions also tend to sensitize the fuel to ignition.

Effect of TEL

The effect of these preflame reactions can be minimized by raising the octane rating of the fuel with tetraethyl lead. In this way, *tetraethyl lead* not only prevents knock . . . but *also reduces the tendency for the fuel to be ignited by a hot surface.*

More Information

More complete details on the Du Pont Petroleum Laboratory's pre-ignition studies are now available to you through any Du Pont Petroleum Chemicals Division district office. Ask for papers entitled "Pre-Ignition in Automotive Engines" and "An Investigation of Pre-Ignition in Engines."

New Lube Oil Show to Help Marketers Stimulate Dealer Promotion

A new lube oil presentation for dealer meetings is now being made available to oil marketers by the Du Pont Petroleum Chemicals Division.

It is especially designed to help you impress your dealers with the value of promoting more frequent oil changes. The same "flannelboard" visual-aid technique as used for the highly successful Du Pont-designed *Brand Name* program is employed for putting across this new promotional tool.

The general theme of the show is: "Good oil seldom wears out . . . but it can become dirtied to death." The individual points emphasized in the presentation can be personalized to bring out the special quality features of your own brand of motor oil.

If you are interested in having one of these personalized lube oil presentations made up for use in your own dealer meetings, we suggest that you talk over the details with a Du Pont Petroleum Chemicals Division representative.

Assistant West Coast District Manager

WILLIAM B. GEST, recently appointed assistant manager of the Petroleum Chemicals Division's West Coast district, has been with the Du Pont Company since 1941.

Until 1945 he served in various engineering capacities at a number of Du Pont-operated government ordnance plants. He then spent two years doing cost engineering work in the Engineering Division and at several company plants.

He joined the Petroleum Chemicals Division in 1947 as a sales-service representative.

Mr. Gest studied engineering and military explosives at Ohio State University, where he also received a B.S. degree in Business Administration.

WILLIAM B. GEST

Du Pont Test Cars Show How to Take the "Toll" Out of Toll Roads

Super highway toll roads and fuel test cars have both been around for a long time.

But it took the ingenuity of a major oil company to put the two together and come up with some amazing results.

When the Garden State Parkway in New Jersey was opened last summer, two Du Pont test cars were on hand for the official opening ceremony. Their job, however, was far more important than merely looking decorative in the official caravan.

Sponsored by one of the large oil companies marketing in the New Jersey area, the cars were used to show the Highway Authority how the new parkway saves the motorist 40% on gasoline mileage and at least 25% in time when compared with the old traffic-congested route.

After the results of the test had been tabulated, the Garden State Highway Publication declared that motorists will save more than the parkway toll by using the new road because of the gasoline savings it makes possible.

LITERATURE AVAILABLE

Here is a partial listing of the bulletins, reports, booklets, technical papers and aids available to you through any of the Du Pont Petroleum Chemicals Division district offices listed below:

Pre-Ignition in Automotive Engines — This paper discusses mainly the glowing tendencies of combustion chamber deposits and the pre-ignition tendencies of individual hydrocarbons Serial A-5652

An Investigation of Pre-Ignition in Engines—A comprehensive discussion of how compression ratios and other mechanical factors affect pre-ignition. Also the effect of tetraethyl lead in reducing pre-ignition Serial A-5756

Du Pont Fuel Oil Additive No. 2—A 12-page bulletin describing this ashless stabilizer and dispersant which prevents clogging of fuel oil screens Serial A-5201

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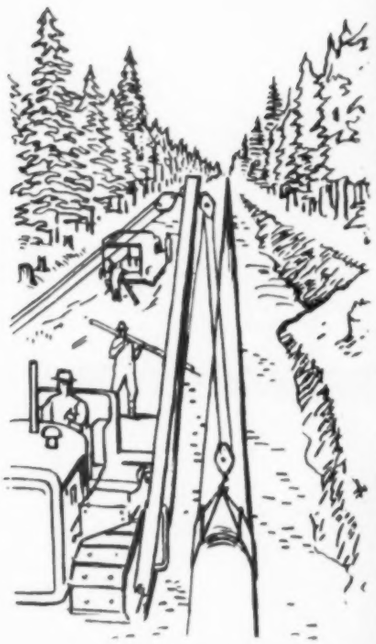

In August and September the world's deepest underwater oil pipe line was laid—4 miles of twin 20" lines dipping 238 feet beneath the Straits of Mackinac.

645 Miles of 30 Inch Pipe Line Built In One Short Summer!

Great Lakes tankers have been able to operate each year, on the average, only during 7 months of open water. In just 5 months—or less than a single tanker season—a great pipe line has been built, breaking this winter bottleneck and providing a continuous supply of oil.

It is the Lakehead Extension, constructed for Lakehead Pipe Line Company, Inc. from Superior through northeastern Wisconsin and the northern Michigan peninsula, under the Straits of Mackinac, through lower Michigan and across the St. Clair River into Ontario.

Under over-all management by Bechtel Corporation as owner's agent, ten contractors were active on the project simultaneously. Such performance is a wholly new concept in pipe line economics . . . with some highly attractive advantages.

Bechtel provides a complete service—economic studies, route evaluation, survey, land acquisition, engineering and construction. Investigation may show that this is the ideal way to build your next pipe line.

BECHTEL

BECHTEL CORPORATION BUILDERS FOR INDUSTRY

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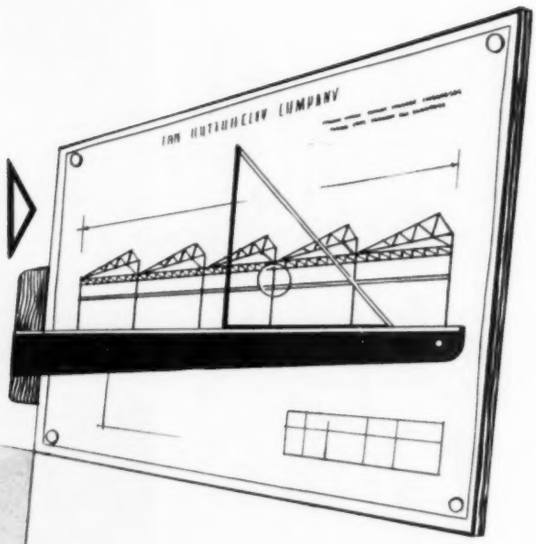
from drawing board



to erection on site

BUTTERLEY

Constructional Steelwork

The Butterfly Company has been engaged in constructional steelwork from its early days and examples are to be found in all parts of the British Isles and in many countries overseas. From design, through the stages of fabrication to erection on site, every structure is invested with the skill and knowledge which have made the Butterley Company famous in the field of constructional steelwork. Welded methods are widely employed today and the shops are well-equipped to undertake the largest and heaviest work of this nature.

THE BUTTERLEY COMPANY LIMITED
RIPLEY, DERBY, ENGLAND
LONDON OFFICE: 20 ASHLEY PLACE, VICTORIA, S.W.1

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SOMEDAY . . . *it will be for real!*

Building with blocks is as much a part of a young boy's life as baseball will be in his teens. Blocks—one on top of the other—to satisfy the typically male urge to create.

As the years roll by, this boy will go on to build bridges or buildings, to make his career in the laboratories of chemical research—or to watch steel being born from ore and earth.

Whatever his future, there will be refractory brick to help him do his job. Blocks of brick to line the furnaces and heat containing vessels—in virtually every step of industry.

There would be no processed raw materials, no production, no living such as we know it but for refractory products which Grefco furnishes in quality and quantity to keep the nation on the move.

To the boy above, a very Merry Christmas and a great many Happy and Prosperous New Years. In his hands lies the future of America.

GENERAL REFRACTORIES COMPANY
Philadelphia

How a military aircraft problem led to

The Greatest Gasoline Development in 31 Years

TCP* is a revolutionary new gasoline additive that stops the greatest cause of power loss in modern automobile engines. TCP additive is now blended into Shell Premium, and is available at Shell stations throughout the United States.

With the advent of high octane number fuels for peak performance of both military and civil aircraft, the problem of spark plug fouling became critical. Maximum design performance and range of the aircraft were severely limited by deposits formed on the insulating portions of the spark plugs. These deposits caused malfunctioning of the spark plug often at critical times when maximum spark plug performance was necessary. The problem was studied jointly by petroleum suppliers, engine and spark plug manufacturers, and airframe builders both from the chemical and mechanical standpoint.

Shell Research Mobilized

To tackle the problem Shell mobilized its research facilities. First step was development of a dependable test for spark plug fouling. With this test, Shell had the necessary equipment with which hundreds of compounds could be quickly tested—rejected and tested again in different formulations. Round-the-clock testing finally led to the discovery of Shell's TCP additive.

Not since the introduction of tetraethyl lead in 1922 has there been such an important development in gasoline.

How TCP additive helps existing engines—can lead to even better designs

This remarkable ingredient actually changes the nature of combustion deposits inside an engine; actually makes them harmless. Plug-shorting and pre-ignition are eliminated. Now car owners get up to 15% more power—often before using the second tankful. Spark plug life is increased as much as 150%, and gasoline mileage is improved.

Car manufacturers and dealers benefit too! New cars perform the way designers intended; new car buyers have few performance complaints. And for the future, designers can plan for higher compression and horsepower, lighter and more compact engine designs.

TCP is Shell's trademark for this additive. It is another example of the progressive research that goes forward day and night in Shell laboratories. It is evidence again that Shell research provides more and better products from petroleum.

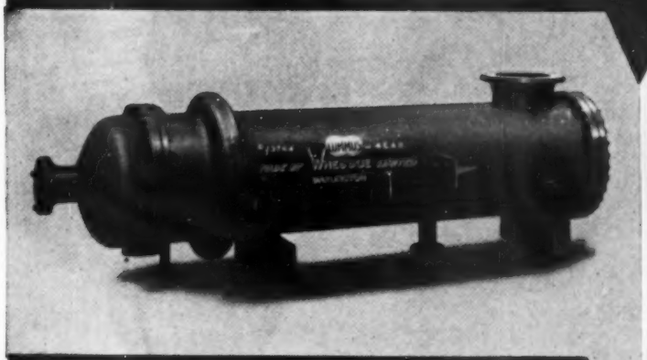
*Patent applied for

SHELL OIL COMPANY

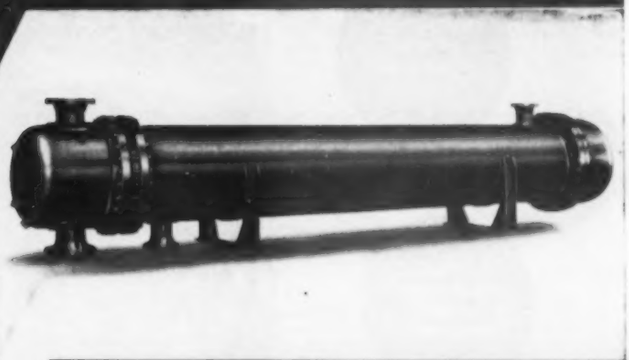
SHELL

WHESSOE

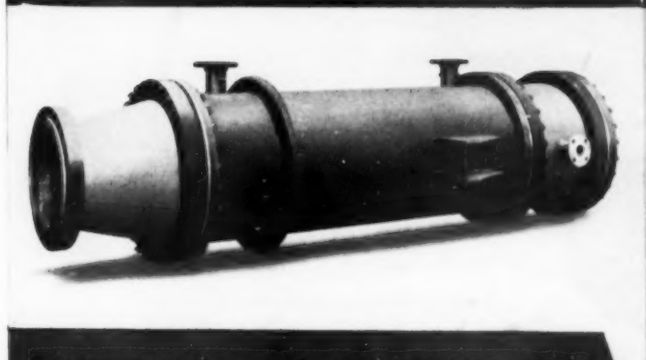
Build all types of HEAT EXCHANGERS



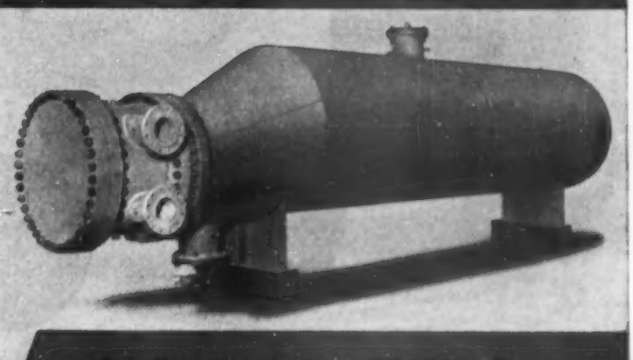
Column Reboiler—single-pass design (32 sq. ft.) of mild steel construction. Test pressures: shell and tubes 225 p.s.i.g.



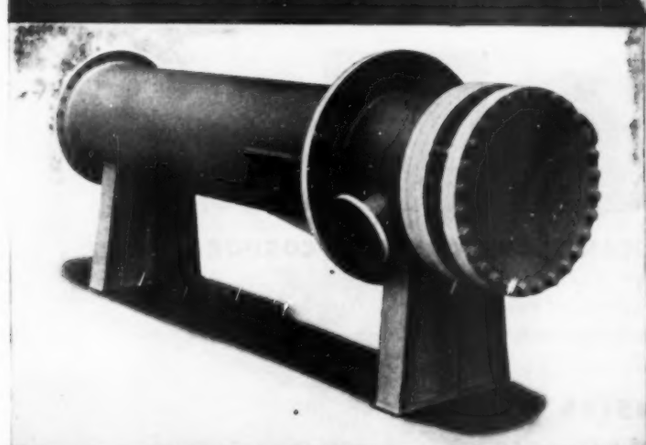
Heat Exchanger—2-pass floating head type (270 sq. ft.). Test pressures: shell, 300 p.s.i.g.; tubes, 500 p.s.i.g.



Condenser—single-pass up-flow design (250 sq. ft.)—with stainless steel tubes and 'Cubrod' steel shell and flanges. Test pressures: shell, 150 p.s.i.g.; tubes, 300 p.s.i.g.



Reboiler—4-pass kettle type (207 sq. ft.). Test pressures: shell, 225 p.s.i.g.; tubes, 350 p.s.i.g. Shell of mild steel construction, tube plates of chrome steel bimetal.



Tank Heater—coil type, mild steel construction, surface area of 500 sq. ft. Test pressure 100 p.s.i.g.

Whessoe Limited are licensed by the Lummus Company to build heat exchangers to their designs and ratings

WHESSOE LIMITED

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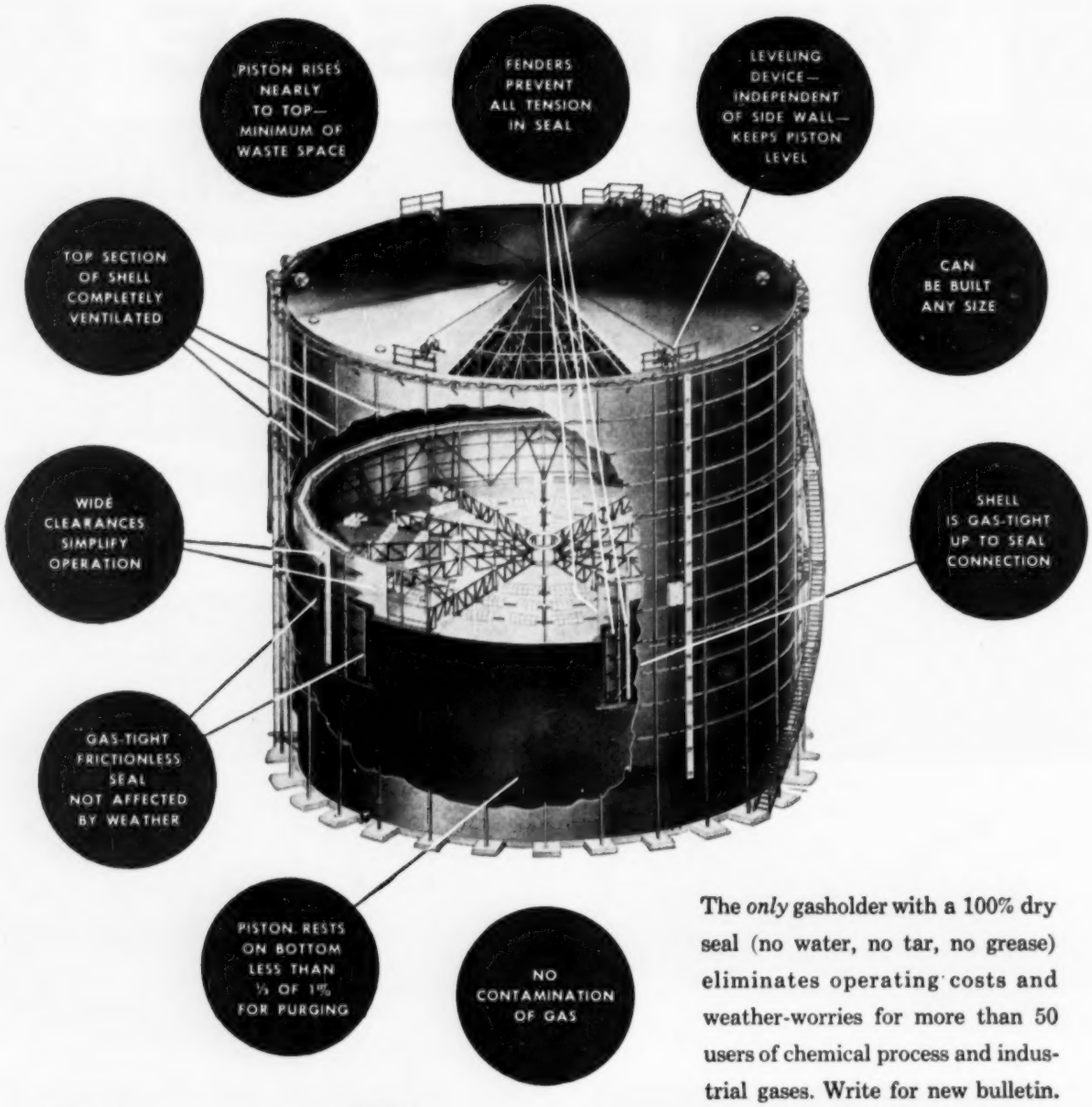
PISTON RISES NEARLY TO TOP—MINIMUM OF WASTE SPACE
FENDERS PREVENT ALL TENSION IN SEAL
LEVELING DEVICE—INDEPENDENT OF SIDE WALL—KEEPS PISTON LEVEL
TOP SECTION OF SHELL COMPLETELY VENTILATED
CAN BE BUILT ANY SIZE
WIDE CLEARANCES SIMPLIFY OPERATION
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GAS-TIGHT FRICTIONLESS SEAL NOT AFFECTED BY WEATHER
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NO CONTAMINATION OF GAS

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Wiggins Gasholder by General American

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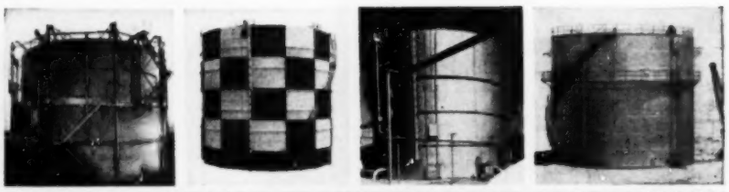
Your old gasholder can be converted to a Wiggins type with all the Wiggins advantages.



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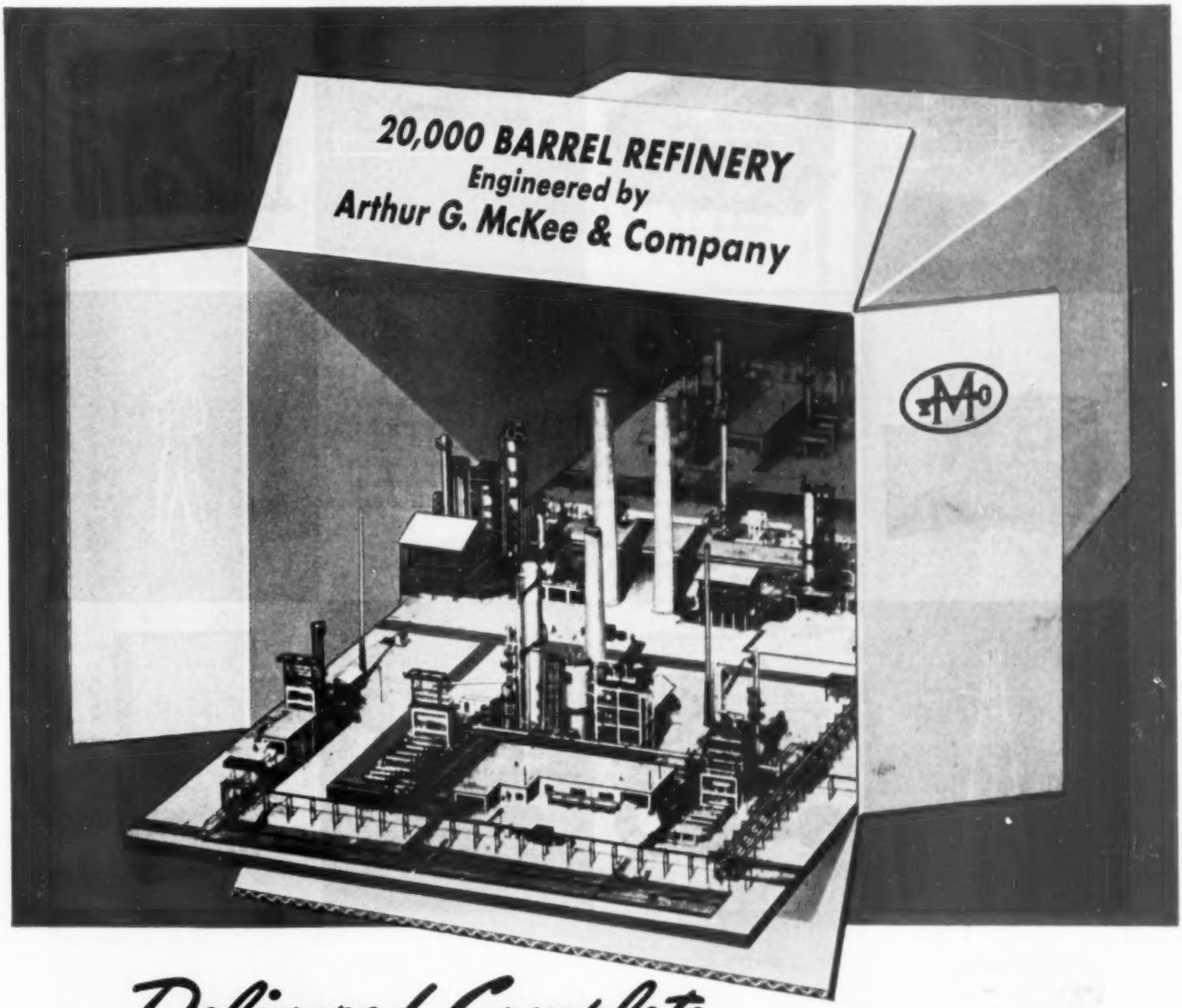

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McKEE does the complete job — design engineering, purchasing, construction, installation of equipment—everything, down to the last detail, ready for initial operation.

Most of it is an old story with us (we've been doing it for many years in many countries) but we are constantly alert to new requirements of the processing industries—constantly improving plant design and construction. That's one of the reasons the McKee organization has established a world-wide reputation for sound, practical, *up-to-date* engineering of all types of petroleum and petro-chemical processing facilities.

ENGINEERING, PURCHASING AND CONSTRUCTION FOR THE PETROLEUM REFINING AND IRON AND STEEL INDUSTRIES

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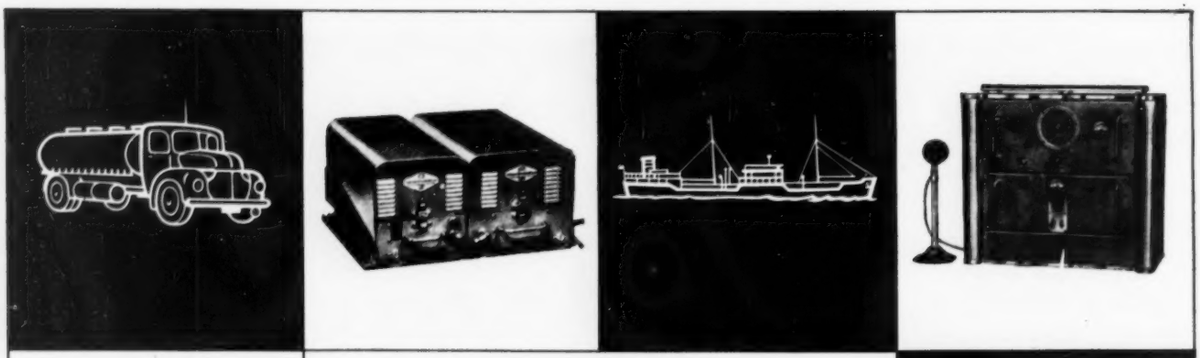
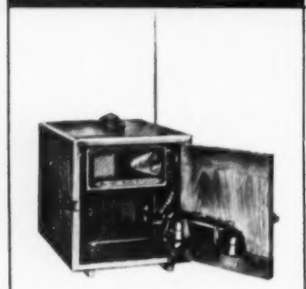


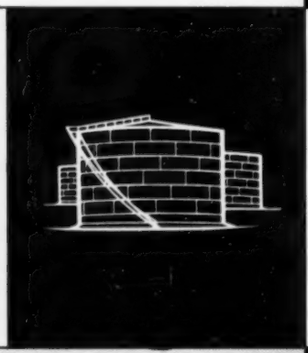


the right move . . .

In more than fifty countries Pye radio-telephones are indicating the right move. The next step, great or small, in divers undertakings.

In the realm of oil, immediate direct communications are vital. The deployment of resources to the fullest advantage demands contact. Contact swift and sure. Contact at speeds to match the action required.

Whenever men, machines and oil are on the move Pye V.H.F. Radio-telephones will promote speed and efficiency.



PYE
Telecommunications
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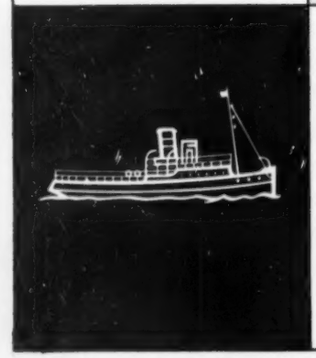

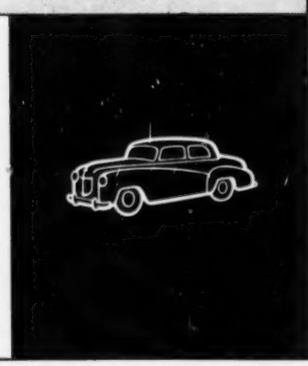

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The Company with
The Best Known Name in Fire Protection *offer you—*

1. A complete range of hand fire extinguishers using every proved form of fire extinguishing medium.

2. Mechanical Foam Generators and Foam-making Branchpipes using "PYRENE" Foam Compound to produce the finest possible foam for extinguishing Refinery and Tank Farm fires.

3. Powerful Foam Tenders capable of producing foam at a high rate of delivery through hose lines or fixed foam risers to tank tops.

4. Foam inductors and proportionators for fixed foam installations.

5. Portable mechanical and chemical foam appliances.

6. Portable telescopic foam towers.

7. CO_2 Installations and portable CO_2 appliances.

8. Expert and impartial advice by fully qualified Engineers and Chemists.

The Pyrene Organisation is proud to offer you an unparalleled service embracing the most modern plant and up-to-date laboratories, backed up by 40 years' specialised experience in fire appliance manufacture.

(Sales and Service Dept. W.P. 12),
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THE Pyrene TRADE MARK COMPANY LIMITED

Announcing Foster Wheeler's new

completely tooled to effectively meet your most exacting needs for steam generators, heat-transfer and process equipment!

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1. 8000 TON BEAM PRESS
Hydraulically operated, will bend steel plates 40' long, 8" thick.

2. PLATE EDGE PLANER
Will take the longest available plates, for cutting welding grooves.

3. OVERHEAD CRANES
Four large cranes capable of lifting the heaviest and largest equipment easily.

4. DOUBLE HOUSING PLANER
Highest speed planing.

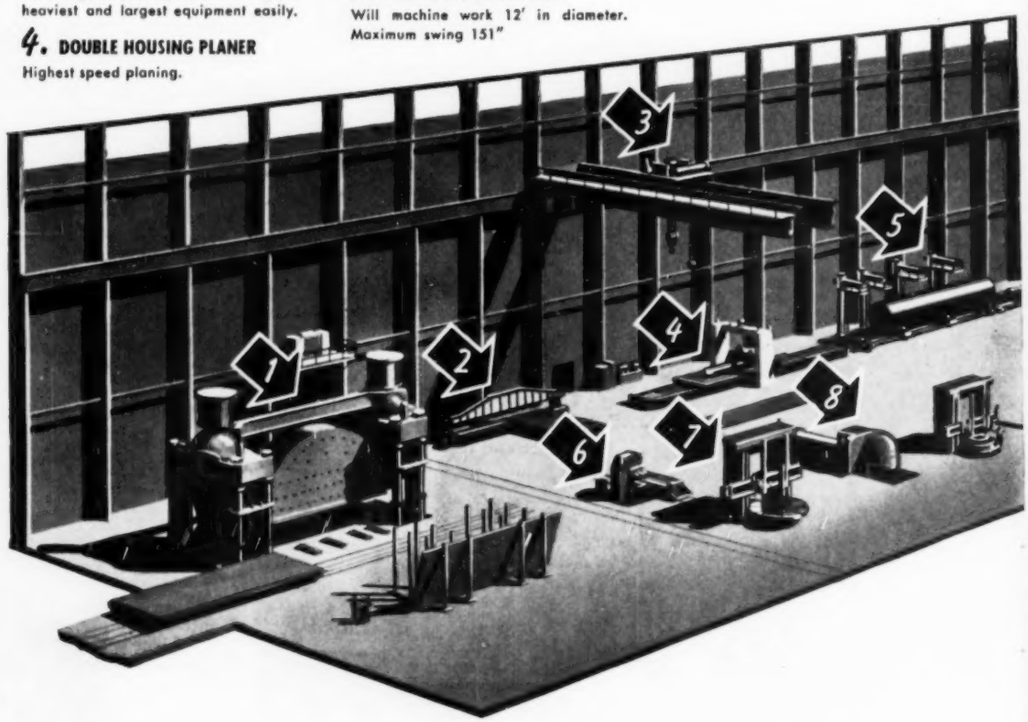
5. AUTOMATIC WELDING MACHINES
Submerged-arc, automatic flux recovery-type, mounted on track.

6. 500 TON CRIMPING PRESS
For cold-bending edge of plate preparatory to rolling.

7. VERTICAL BORING MILL
Will machine work 12' in diameter. Maximum swing 151"

8. BENDING ROLLS—PINCH TYPE
By hot or cold rolling will form cylinders for medium-pressure vessels.

9. HIGHEST SPEED DRILLS—RADIAL TYPE
These are mounted on ways and tracks, power positioned.

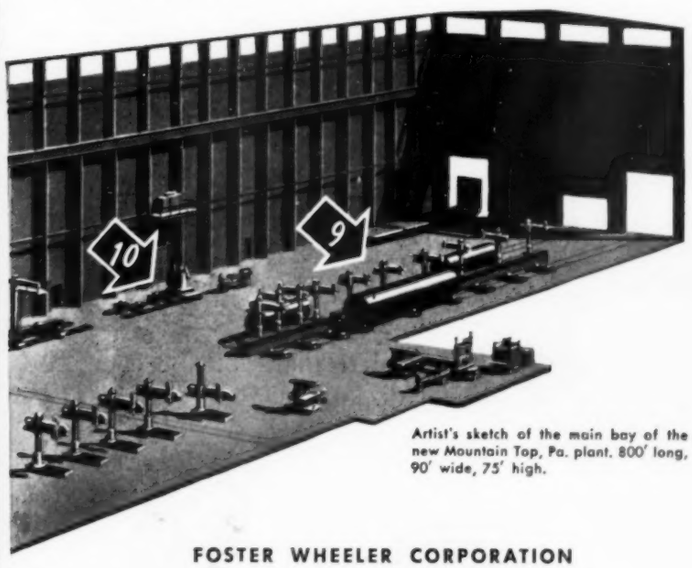


Mountain Top plant...

ANTICIPATING your requirements for more efficient central station, industrial and process components, Foster Wheeler has installed in this new plant, near Wilkes-Barre, Pa., the latest, most modern equipment, such as: the 8000-ton beam press, 2 million volt x-ray facilities, the newest developments in submerged arc-welding and high-speed drilling equipment, 83½ foot long stress-relieving furnace and others shown here.

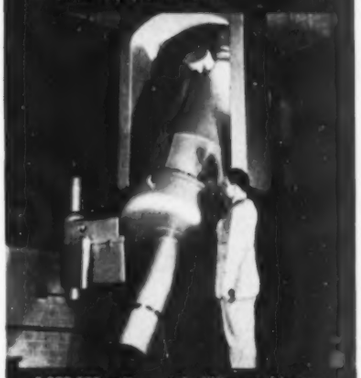
This modern equipment, plus the plant's proximity to steel supplies, and its strategic location for direct rail shipment to all areas of the country, assure you of fast, economical, high-quality fabrication to meet your specifications for the largest and heaviest drums and pressure vessels.

10. **DRUM FACING MACHINE**
Quick preparation of ends of cylinder for assembly with heads.



Artist's sketch of the main bay of the new Mountain Top, Pa. plant. 800' long, 90' wide, 75' high.

Artist's drawing of Foster Wheeler's new Mountain Top plant near Wilkes-Barre, Pa.



2,000,000 volt x-ray facilities enable operators to see through 12 inches of steel.

Stress relieving furnace permits annealing of fabricated parts more than 83 ft. long.

Shot blast building is equipped for surface cleaning by latest practice.

Plate normalizing furnace will take the largest available plates for preheating prior to bending or rolling.

FOSTER WHEELER CORPORATION
Designers and Constructors of
Stationary and Marine Steam Generators and Condensers
Process Equipment • Chemical and Petroleum Plants
NEW YORK • LONDON • PARIS • ST. CATHERINES, ONTARIO

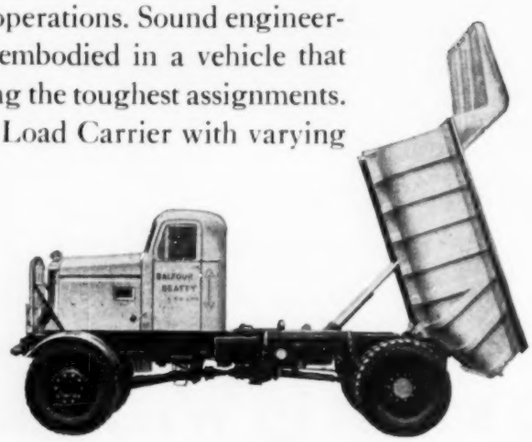
FOSTER WHEELER

The SCAMMELL Dump Truck

Illustration shows a Scammell 4 x 4 playing its part in combined water and land transport of drilling stores for a new Shell exploration area at Bulak-Setap, near Meri, British North Borneo.

A Powerful asset on any job!

The Scammell "Mountaineer" four-wheel drive Dump Truck has been exclusively designed to meet arduous demands of some "off the highway" operations. Sound engineering practice, coupled with the finest materials available, is embodied in a vehicle that will give long life and reliable and economical service during the toughest assignments. The "Mountaineer" 4 x 4 is also available as a Tractor and Load Carrier with varying wheelbases.



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Meet Yati ibn Ahmed, an experienced rigman. As a member of an Arabian American Oil Company structure drilling team, Ahmed makes good use of the skill he learned at ARAMCO training schools. His technical know-how, like that of thousands of his Saudi Arab countrymen who hold ARAMCO oil jobs, is helping develop Saudi Arabia's vast oil resources.

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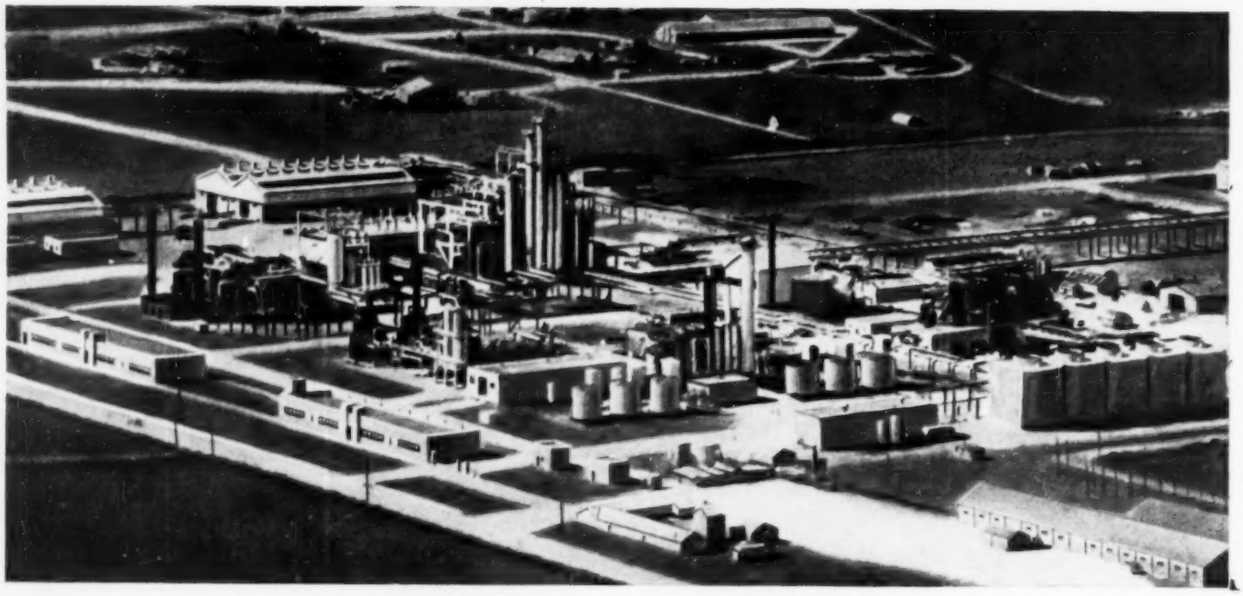
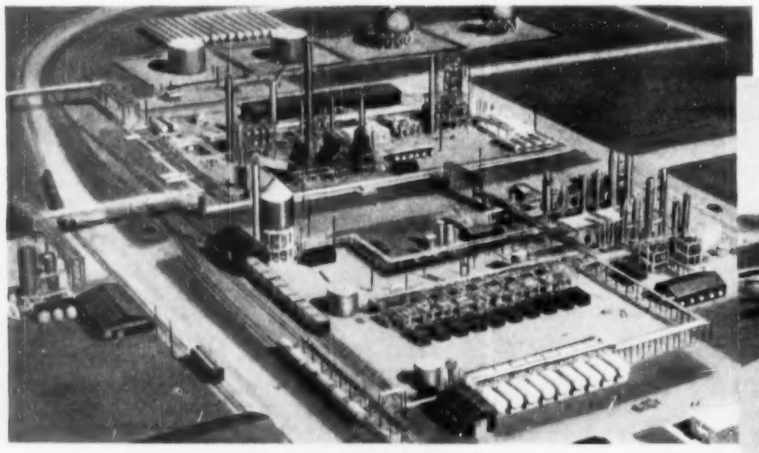


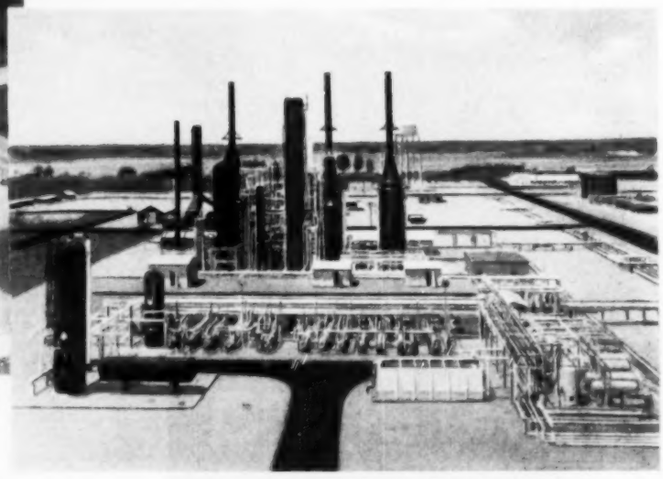
Development Studies *and* Reports

FOR THE NATURAL GAS, PETROLEUM, PETROCHEMICAL AND CHEMICAL INDUSTRIES

Stone & Webster Engineering Corporation, Badger Process Division, has designed and constructed many plants for the process industries to produce intermediate and finished products. Much of this work resulted from development studies and reports made by the Corporation, which included consideration of markets, plant location, raw material supply, processing methods, handling facilities, utilities, transportation and other factors.

The broad experience of the Corporation in the preparation of development and economic studies and reports in these specialized fields is available for new projects.





STONE & WEBSTER ENGINEERING CORPORATION

BADGER PROCESS DIVISION

AFFILIATED WITH E. B. BADGER & SONS LIMITED

There's EVERY Size in the BETHLEHEM FAMILY of PUMPING UNITS

It seems that scarcely a year goes by without new oil-field pumping problems, and new demands for additional Bethlehem pumping units. Not so long ago we were telling you about a little fellow called the 16D-5. Now there's one even smaller — the Bethlehem 10D-4, a tiny mite with 10,000-in.-lb torque capacity and load rating of 4700 lb at the polished rod. This beam-balance unit is perfect for water-well service or shallow stripper-well assignments. No longer need you buy over-sized equipment for your small pumping jobs.

Of course this smallest machine is but one of many units in the Bethlehem line. It has plenty of bigger brothers in the medium-sized bracket. And if you keep on climbing, you'll finally come to the whoppers—as, for example, the mighty 320.

But even that one isn't the biggest. Now in the field is the family colossus, Bethlehem's 640. This king-size giant is designed to lift oil from wells ranging to two miles in depth. Its long, slow 12-ft stroke has an API rating of 640,000 in.-lb (708,000 in.-lb at nine spm). This slow stroking eliminates gear overloads and excessive rod stress.

Thus Bethlehem offers a unit for every condition of modern pumping – from shallow water wells to deep-down oil strikes. Remember that the next time you add new outfits to your equipment. In the meanwhile, a Bethlehem engineer will gladly send complete details whenever you say.

BETHLEHEM STEEL EXPORT CORPORATION

25 Broadway, New York 4, N.Y., U.S.A.

Cable Address "BETHLEHEM, NEWYORK"

★

BETHLEHEM STEEL

★

Bethlehem also manufactures a complete line of rotary drilling equipment—draw works, slush pumps, crown and traveling blocks, swivels, and rotary tables.

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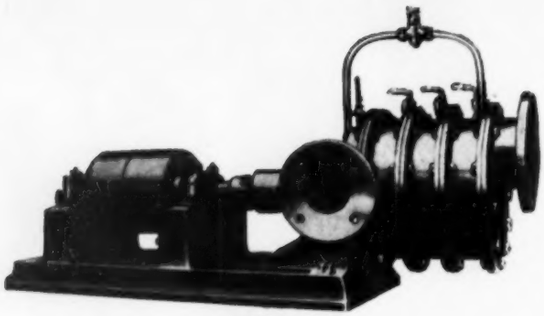
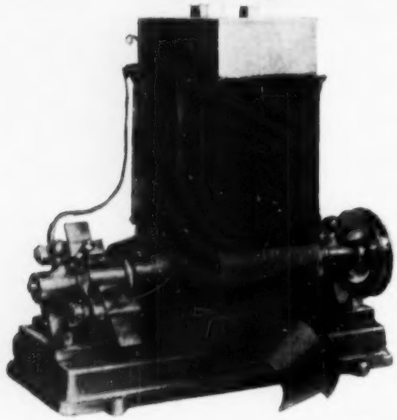




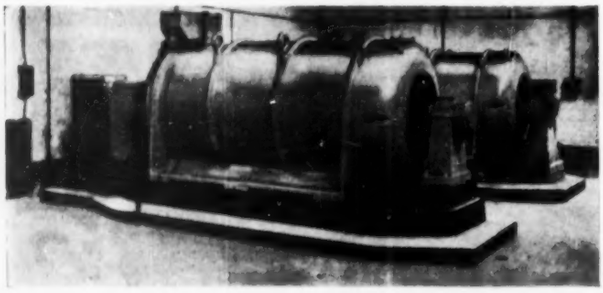
—1858

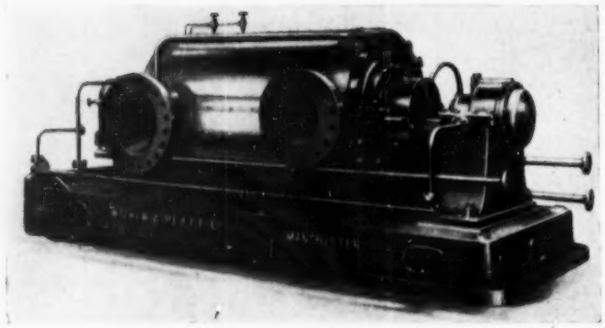
A GREAT PAST

——1882

Mather and Platt were making centrifugal pumps in 1858. The first Mather-Reynolds Turbine Pump, illustrated at top left, was patented in 1876. A few years later—in 1882—the company entered the field of Electrical Engineering and the inventive ability of Thomas A. Edison and the scientific attainments of Dr. John and Dr. Edward Hopkinson were combined to produce the first electric generators which can rightly be said in the technical sense to have been designed. The illustration on the left shows an early Edison-Hopkinson machine built by Mather and Platt.

A RENOWNED PRESENT . . .





The present day products of the Pump and Electrical Departments of Mather and Platt Ltd. are in every sense worthy of this long tradition. The bottom photograph shows a modern "Plurovane" pump built for main line work, moving a throughput of 50,000 bbls. per day of crude oil against a pressure of 750 p.s.i. when running at 1,500 r.p.m. The photograph above it shows Mather and Platt totally enclosed flame-proof motors, also engaged on main-line duties. They are of 1,000 h.p. capacity 1,480 r.p.m. fed from 3 phase 50 cycles 6,000/6,600 volt supply. They are squirrel cage machines, direct-on started with a starting current four times full load value.

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REFINERY PROCESS NEWS

PUBLISHED BY REFINERY PROCESS DIVISION, THE M. W. KELLOGG COMPANY DECEMBER 1953

Chile's First Refinery Now Well Underway

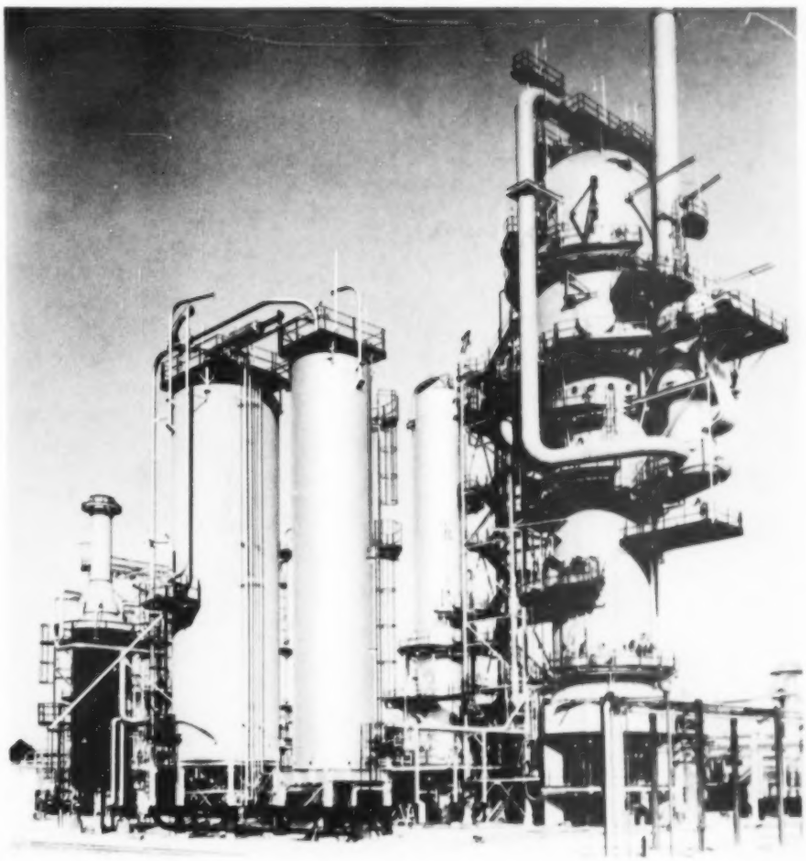
Construction is now well underway on Chile's first petroleum refinery. It was designed by Kellogg and is now being erected under supervision of Kellogg Pan-American Corporation. The new plant will be located ten miles north of Valparaiso and is expected to be on stream by mid-1954.

This $10,000,000 refinery, being built for Expresa Nacional del Petroleo, will have a crude charge capacity of 20,000 BPD and will employ the most modern type of combination thermal equipment to process either indigenous or imported petroleum.

Processing steps include topping, visbreaking, gas oil cracking, thermal reforming, gasoline stabilization and treating. In addition to motor gasoline, the refinery will produce LPG, tractor distillate, kerosene, two grades of diesel oil and heavy fuel oil.

This is only one of several major projects currently underway in South America by Kellogg. Others include a complete refinery in Argentina; two refineries (of 5,000 BPD and 10,000 BPD capacities) and nitrogen fertilizer facilities at three different locations in Brazil.

Shown in the foreground is the stabilizer tower of the new refinery while in the background is the framework of the furnace for the naphtha reformer.



First Model "B" Orthoflow Cracker Goes on Stream Smoothly at Toledo

The first of Kellogg's new Model "B" Orthoflow Fluid catalytic cracking units has now been put on stream at Pure Oil's Toledo refinery. Reports from the first three weeks of operation indicate that the new design is completely successful. Catalyst loss is at a minimum, coke-to-conversion ratio is low, and flexibility excellent.

This new model is one of two versions of Kellogg's exclusive Orthoflow design both of which involve the single vessel construction with straight-line flow of catalyst. The Model "B" Orthoflow, as differentiated from the Model "A," has the regenerator placed above the reactor. As a result, the regenerator is operated at a lower pressure than in the Model "A", which brings about savings in direct operating costs due to reduced horsepower requirements for compression of regenerative air.

For example, in the Model "A", pressure of about 18 pounds is required in the regenerator with a simultaneous pressure of ten pounds in the reactor in order to maintain the optimum circulation of catalyst from one zone to the other. In the newer "B" design, the reactor pressure is held at about 15 pounds while the regenerator is operated at a pressure in the order of seven pounds—retaining the same eight pound differential while simultaneously transferring the major compressor requirements to the lower pressure side of the operation.

In addition to obtaining a significant decrease in the compressor horsepower required to supply combustion air to the regenerator, this arrangement has another advantage. The higher reactor pressure permits a slight decrease in the size of this vessel as well as in that of the fractionator.

(Continued on reverse side)

REFINERY PROCESS NEWS

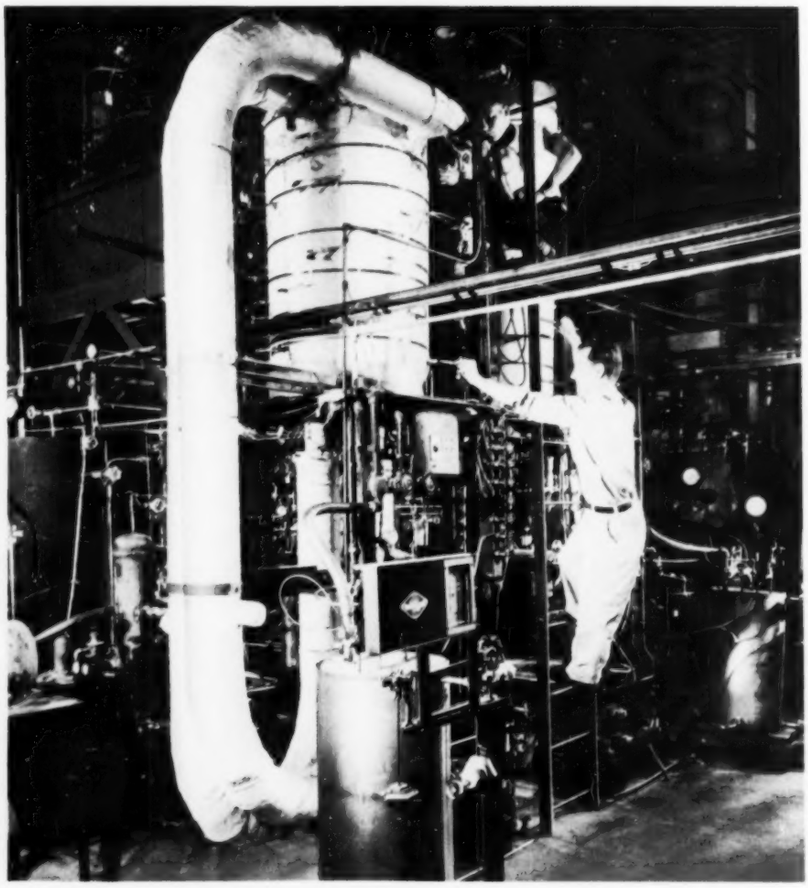
CONTINUED FROM PRECEDING PAGE

Model "B"...continued

While on the surface it would appear that the Model "B" should always be preferred over the Model "A" this is not necessarily the case. The final selection is inevitably dependent upon the individual refiner's processing requirements.

Regardless of which type a refiner installs, commercial operating experience with the five Orthoflow units already built by Kellogg clearly establishes the superiority of this new design. For example, just recently a Model "A" design was placed on stream abroad. The ease with which the unit can be started up and operated is indicated by the fact that Kellogg's operators were released only six weeks after placing the plant on stream. At that time the unit had completed a thoroughly satisfactory demonstration run and had been accepted by the refiner. Considering that the Kellogg operators faced a language barrier in training the refiner's operators in addition to dealing with equipment of foreign manufacture, there's slight question but that this short start-up and indoctrination period constitutes an excellent performance record.

Meanwhile, six other Orthoflows are underway. With capacities varying from less than 2000 to more than 28,000 BPD in fresh feed, they are going up on sites in as widely separated sections of the world as Australia, Texas, Pennsylvania, Yugoslavia and Canada.



New Pilot Plant for Data on Platinum Catalyst Life

Shown here is a new four-barrel-per-day pilot plant Kellogg has just completed in its extensive pilot plant laboratories in Jersey City. It is currently being used to pinpoint the ultimate life of the regenerative-type Sinclair-Baker RD-150 platinum catalyst.

Two commercial units employing the RD-150 catalyst are now underway, one on the East Coast and one in the Midwest.

Foundation Work Marks Site of New Fluid Hydroformer

Foundations are well along on this large Fluid Hydroformer—one of two currently being erected for Cities Service. This one at Lake Charles is scheduled for completion in 1954. The other is being built at East Chicago.

Still a third Fluid unit is now being engineered for another refiner located in the Mid-West.

For further information, technical data, etc., on any refining process, write

REFINERY PROCESS DIVISION

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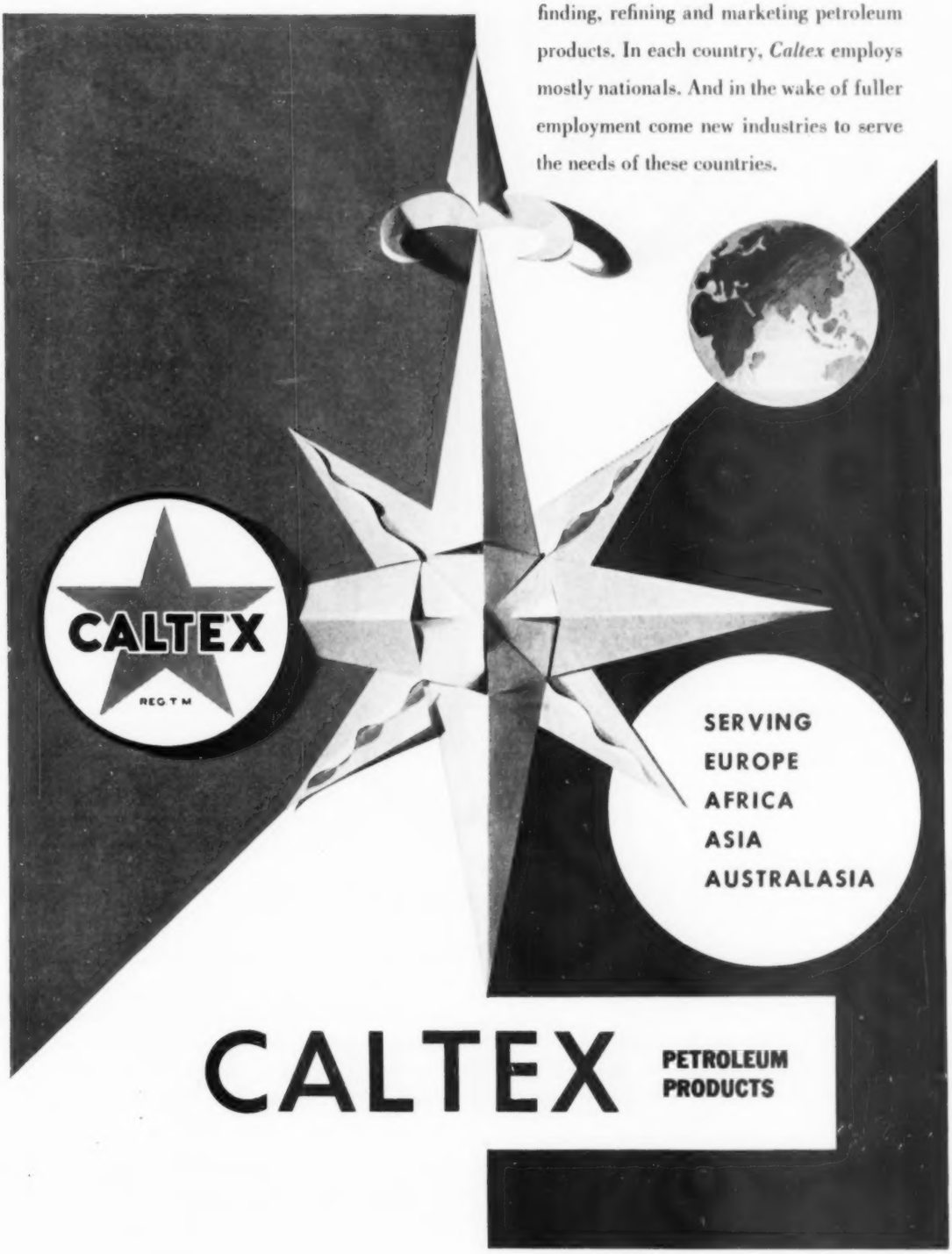
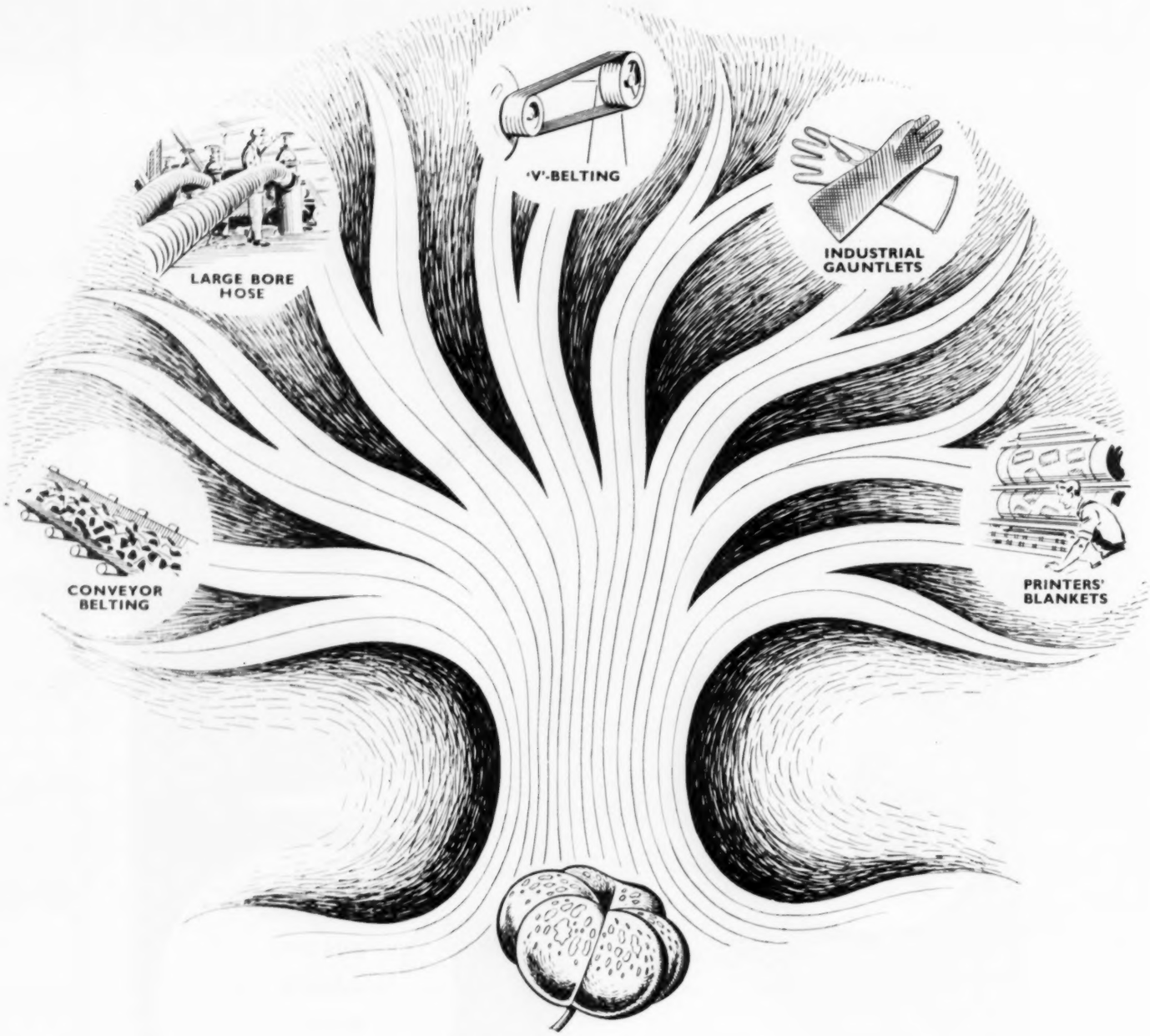


CALTEX PETROLEUM PRODUCTS



HEVEA BRASILIENSIS

This is the rubber tree of flourishing growth from the seed of which stem many fruits. Industrial gloves, conveyor belts for mines, flexible hose for refineries, hot water bottles, power transmission beltings and acid-proof linings — these and many others are the produce of Hevea Brasiliensis—yet the limit of the usefulness of the tree is not even in sight.

Since 1888 when the Dunlop Rubber Company was founded, rubber has come to equal coal and steel in importance to industry. Dunlop experience throughout these 65 years of development qualifies us to investigate and advise towards the solution of your problems. Please write to us . . . the obligation is on our side . . . to find the answer.

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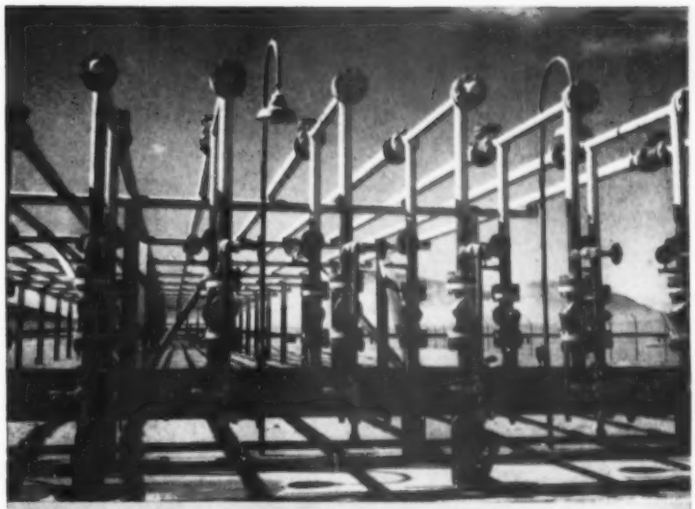
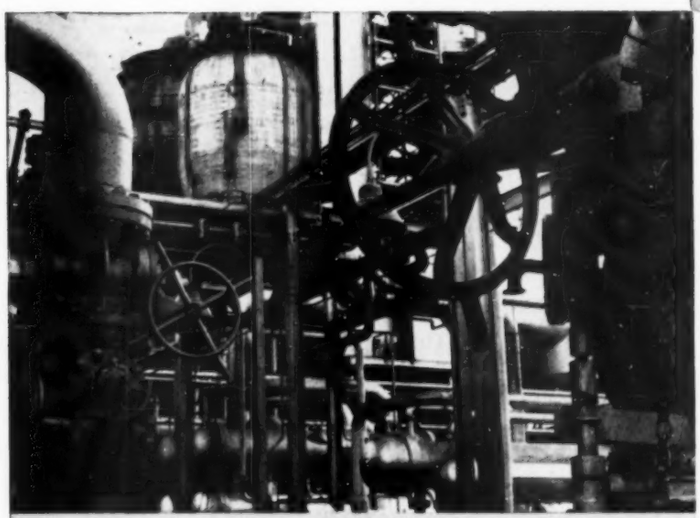


GAS Manifold of Audco-Nordstrom valves installed on gas lines at a separating station in Saudi-Arabia.



OIL Gear-operated Audco-Nordstrom valves on lines carrying rich oil at a refinery in England.

Chances are your plant has lines carrying gas, oil or hot water. Perhaps it uses all three. If so, there is one type of valve that can solve your problems on all of these services—an Audco-Nordstrom Lubricant-Sealed valve.

The internal system of lubrication in Audco-Nordstrom valves does three things not possible in non-lubricated valves—provides a positive seal against leakage, keeps the valve ready to operate easily at any time, and protects the vital seating area from corrosion and abrasion.

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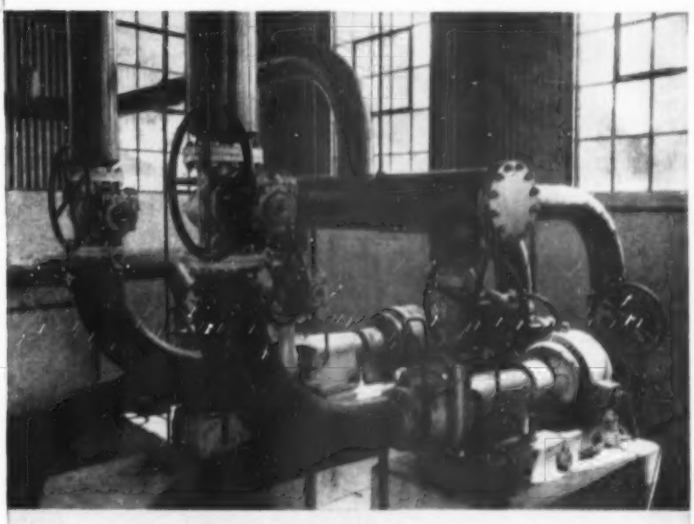
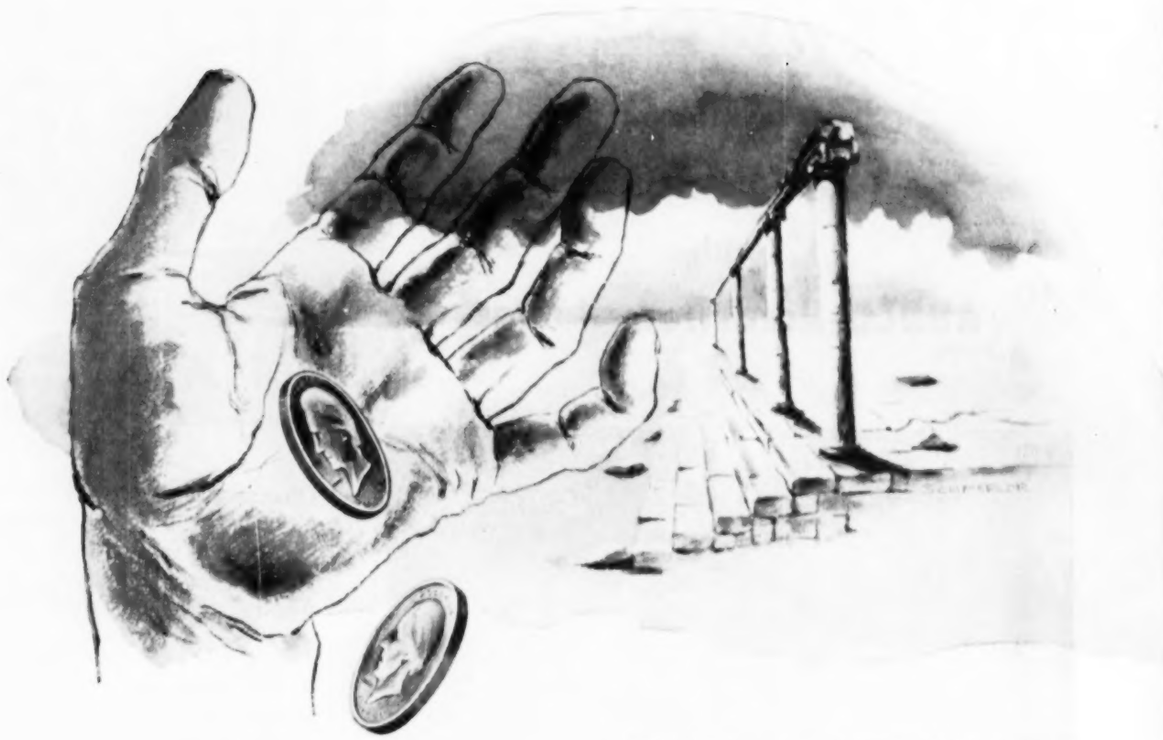


HOT WATER Audco-Nordstrom valves on hot water pump lines in a large boiler house.



what's the cost in the long run?

This important question should be foremost in the mind of every petroleum refiner when he is considering large capital investments in petroleum refining facilities.

The installation of a refining process is an important step that merits the careful consideration of every factor affecting refinery economics over a substantial period of time. Consequently, the investor should be vitally concerned with the extent of continuing

service available through the company with which he is dealing.

While the selection of a refining process, and the construction of each component are matters of extreme importance, the extent of service that the refiner can actually count upon after the process is operating should not be dismissed without very careful investigation.

Universal invites, and suggests that every petroleum refiner make an impartial comparison of the many services available through its broad and comprehensive program, and the services offered by other organizations now in the business of licensing petroleum refining processes.

Your own answer to . . . . What's The Cost In The Long Run . . . . should reveal the most economical and profitable course to follow.

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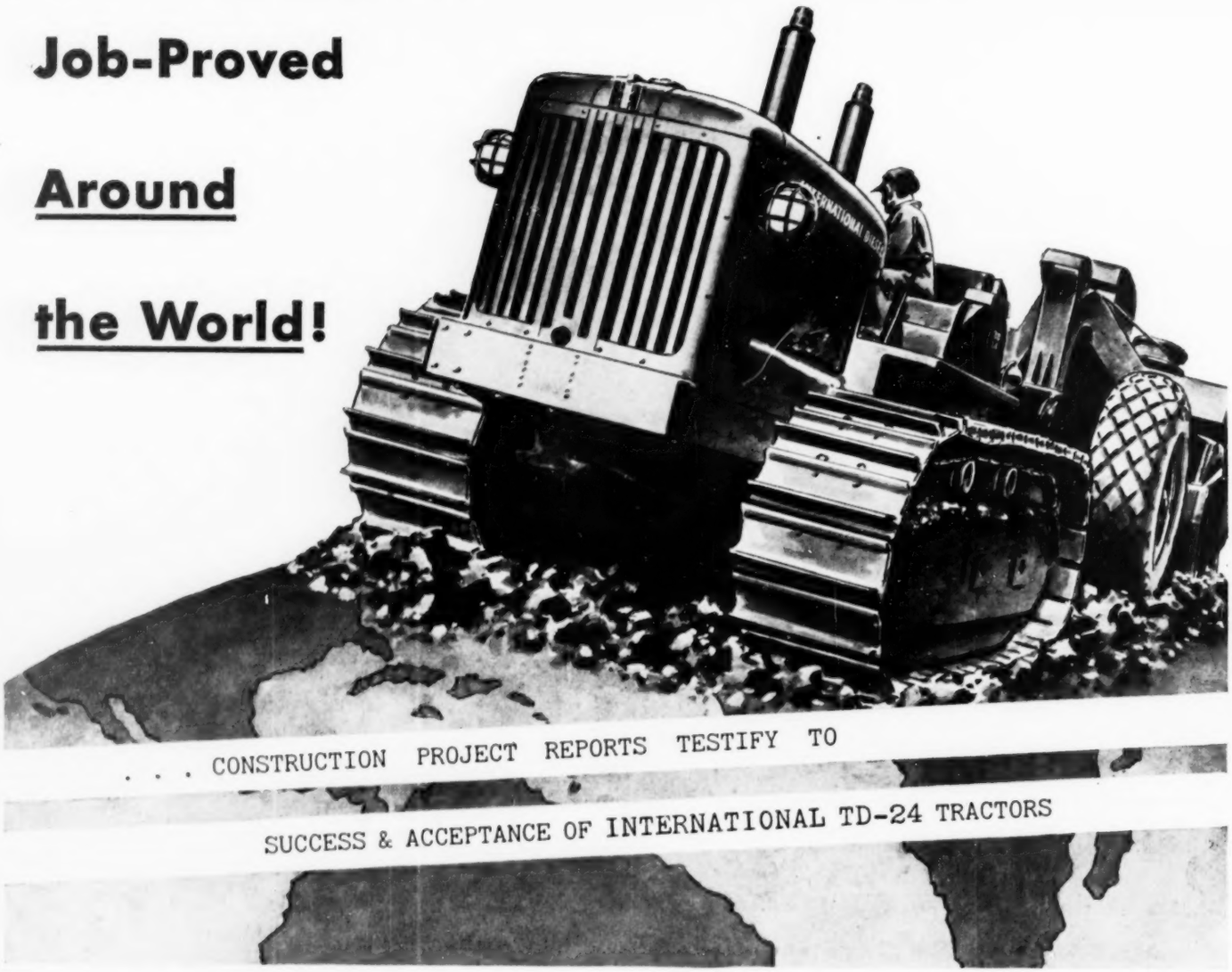

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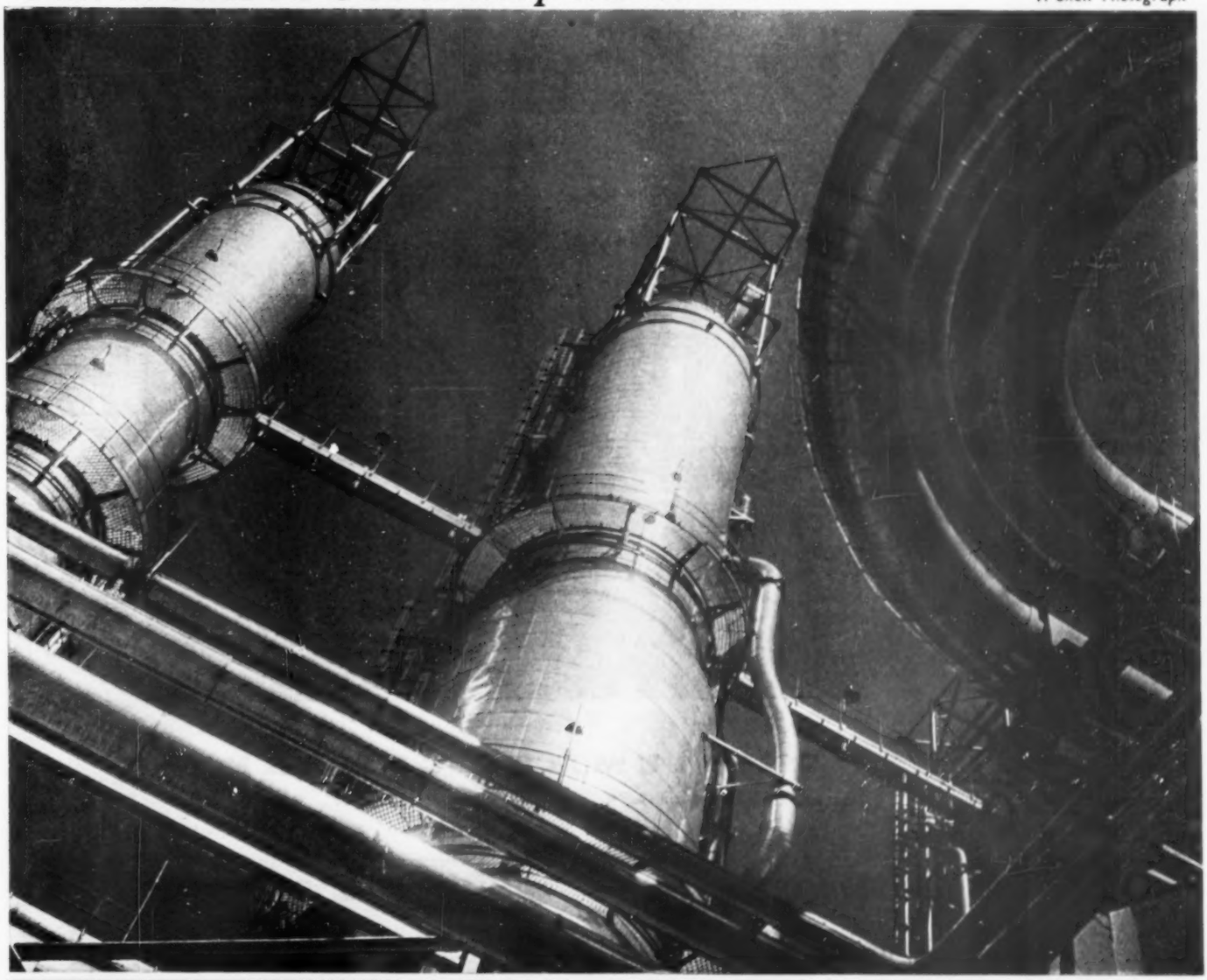
The photograph shows columns on the Distillation Unit, M.E.C. project, Shell Haven, England.

Call in KENYON to keep the heat in!

A Shell Photograph



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VOL. 24, NO. 13, DECEMBER 1953

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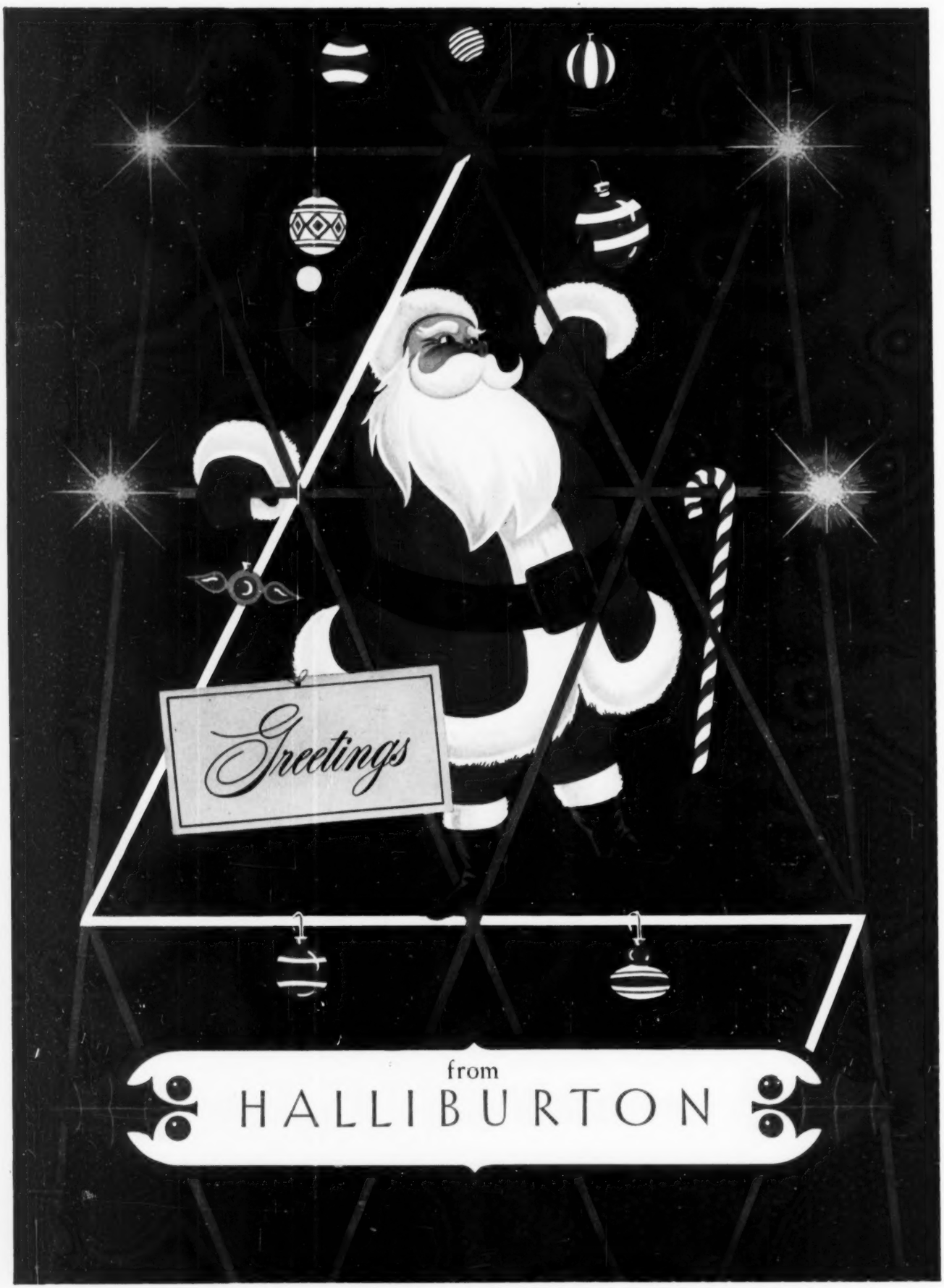
THIS MONTH'S COVER

Unhooking the kelley at a well in Scurry County, Texas. Drawing by Leonard Ruben, WORLD PETROLEUM art director, is based on a photograph by Russell Lee for Cities Service Company.


Greetings
from
HALLIBURTON

YEAR PROVES BETTER THAN ITS PROMISE

IT SEEMS LIKELY that 1953 will go down in history as the year of the Big Fear. Not only in the sphere of business, but in the broad field of world politics and international relations, the year has progressed in an atmosphere of uncertainty. A summary of conditions as the year nears its end indicates that the final showing will be better than was anticipated.

Industrially the year has been one of record activity, with employment reaching a new peak level in the United States and in a number of other countries. The average of personal incomes is higher than ever before. The progress of rehabilitation in nations that suffered most severely in the war has become more evident than in any previous year. While new wars have threatened, none has been started and in one quarter fighting has come to an end, at least temporarily. When accounts are finally balanced, it seems certain that 1953 will rank as a "good" year. Yet confidence has not been fully restored.

The petroleum industry has followed the same general pattern as others in this respect. At the beginning of the year oil company economists forecast, quite logically, some slowing down of the abnormal rate of expansion that had prevailed since the beginning of the post-war period. Opinions were cautiously advanced that a fairly good demand for products might be maintained during the first part of the year with a probable falling-off later on which would be accentuated if an armistice were established in Korea.

In the actual event, consumption in the United States has shown a well-sustained growth, causing the Bureau of Mines to revise its estimate of demand upward to an average of 7,732,000 barrels daily, an increase of 6.2 percent over 1952. Financial reports of oil companies for the third quarter the year have shown in most cases a substantial gain over the corresponding period of 1952 and in some instances the best earnings for any of the first three quarters of the year. For countries other than the United States, the proportionate gain has been even greater, as has been the case in other recent years, indicating a gain of 7.2 percent over 1952.

Among less favorable features in the year's developments, oil men, in common with members of other industries, have been disturbed by the rise in inventories. Petroleum stocks, both crude and products, have increased to new high levels although the quantities, measured in days of supply at present rates of consumption, are not as great as they have been at times in the past. Continuation of the trend, if not checked, might bring stocks to a point of unwieldiness that could affect market stability. The best assurance that this will not occur is the fact that the industry as a whole is aware of the danger and that steps are being taken to avert it.

Moreover, the oil industry is well buttressed against the likelihood of decline in the demand for its products. With more than 50 million motor vehicles in the United States and with yearly accretions both to the total number and to the yearly mileage run by the average car, there is little likelihood of a slump in the demand for motor gasoline. The family car is so essential a part of American life that even in times of depression it seldom is dispensed with. Consumption of middle distillates also rises year by year despite weather variations.

Manifold problems still confront the oil and gas industry. One of the most serious is the steadily rising cost of finding and developing new sources of supply to replace wells that become exhausted. Much money and effort are being expended in attempts to improve the methods and instruments of exploration and to apply more power and more efficient tools to the speeding up of drilling. One difficulty is presented by the pressure of authorities concerned with national security for the development of more reserve production potential since no practical means has been offered for providing adequate recompense for the heavy cost of establishing and maintaining reserves that can be used only in an emergency. These and many other difficulties have to be faced, but one fear that need not obsess the oil man is that of falling demand.

Industry's surplus capacity studied at API meeting

P. C. Spencer, president of Sinclair Oil Corp., newly elected chairman of the board of directors of the American Petroleum Institute. Last year Mr. Spencer was API vice president for the division of transportation. Charles S. Jones, president of Richfield Oil Corp., Los Angeles, was elected divisional vice president to succeed him.

MEMBERS of the American Petroleum Institute were preoccupied at the Chicago meeting early in November with the effect of excess producing capacity on future markets for oil products. While some asserted that action should be taken to effect a drastic reduction in imports of foreign oil, others felt that a normal historical relationship between domestic and imported products should be maintained and that the industry should exercise the self-restraint necessary to live with a temporary surplus.

In his annual presidential address, Frank M. Porter discussed the industry's responsibility to the nation in maintaining an adequate supply of oil for the long as well as short term.

"Today we have a situation of excess petroleum supply that is more than equal to meet the short-term, peace-time demand of the immediate future," he said. "This burden, however, of the current surplus, in itself, can reduce the industry's ability to meet the long-term demand, for future supplies are the results of the efforts that are being made today. In making this statement I do not intend to be an alarmist, for I have the utmost confidence in the industry's ability to meet and resolve the problems with which it is currently faced. The present situation of supply and demand is not a new one nor is it any more critical than it was during similar situations which have occurred in the past. Many in the industry are disturbed over the surplus and there is cause for alarm but only to the extent that we critically analyze and recognize the conditions which are responsible for the present situation.

"Any discussion of domestic petroleum supply and demand must necessarily take into account the import-export balance factor. The subject of imports has been a most controversial problem. By and large there is general recognition that the volume of imports necessary to supplement domestic production is desirable and important and there is full agreement that imports in volumes that will impair the vigor and health of the domestic industry are undesirable. There is, however, a wide difference of opinion as to the level of imports which would satisfy this complicated equation. The problem should be properly rationalized and an area of understanding achieved consistent with the many factors involved."

In an address prepared for presentation before the annual meeting of the Association of Petroleum Writers, a strong plea for reduction in imports was made by Lt. Gen. Ernest O. Thompson of the Texas Railroad Commission. He asserted that "we are importing about 300,000 barrels per day too much crude and products."

General Thompson expressed the hope that a law would not be required to curb imports. In this he was seconded by P. C. Spencer, president of Sinclair Oil Corp., who was elected chairman of the A.P.I. Board of Directors to succeed L. S. Wescoat of Pure Oil Co., who has served in that capacity for two years.

Mr. Spencer spoke at length of the responsibility of the oil industry to the welfare of the nation and asserted that it has done a good job in the past and can continue to do so if not hampered by the encroachment of regulations. He was explicit in stating that government cannot find, transport and process oil as successfully as private enterprise and that excessive regulation can keep oil from development.

Discussing the relationship of the industry to government, he pointed out that present problems of over-capacity are a direct result of the government's request for such a surplus. "Within the past few years," he said, "government officials responsible for defense and security came to the oil industry with the suggestion that a surplus capacity of oil production and refining—adequate for any emergency—be developed. They originally visualized a surplus of one million barrels a day in excess of current domestic demand. As usual, the oil industry responded. Drilling operations involving the expenditure of billions of dollars were speeded up. New refineries were built, and major additions to existing refineries were designed and constructed.

"No practical member of the oil industry was surprised at the consequences. Increased available oil insists upon a market. Surplus refining capacity cries out for use. There is not enough storage capacity to stockpile the potential extra supply. While the industry was striving to attain the indicated goals, the output of foreign fields and foreign refineries mounted rapidly. It is evident that there is a need here for a wise policy in handling the train of problems arising from all these developments.

In a statement to the A.P.I. board of directors, Charlton H. Lyons, president of the Independent Petroleum Association of America, took a moderate view of the oil situation. He agreed that the oversupply is not entirely due to excessive imports and pledged the I.P.A.A. to a policy of seeking a solution of the import problem by voluntary action. He warned that if a solution is not reached that independent producers will "fight for the preservation of the principles they deeply feel to be in the best interests of our country."

Mr. Lyons recognized the value of foreign oil to the United States and offered no condemnation of importing companies.

"Thoughtful producers do not attribute all domestic injuries to imports," he said. "They recognize that factors other than imports have contributed to the present oversupply of petroleum. The prolonged steel strike, the refinery strike, dieselization of the railroads, reduction in exports, keen competition with coal, the increased use of natural gas, abnormally warm weather and excessive domestic production have all played a part—together with imports—in creating the present oversupply situation."

He agreed that foreign oil is needed to supplement domestic demand and to meet military requirements.

He referred particularly to the value of Middle East oil to the Allies in World War II and stated that it still is important in the present struggle of the democracies with communism.

"Our foreign policy as to oil must also take into account that Middle East oil is dangerously exposed to aggression and hence is not a dependable source of supply," he said. "And further, although we are confident that Latin American oil will be available to us in peace and war, it will be available in war only to the extent that our armed services can protect shipments of oil from that area.

Mr. Lyons stated that the necessary adjustment in imports is not large, and that being true, he urged that domestic producers and importers avoid recriminations and "sit together and understandingly consider mutual problems with an open mind and earnest desire to resolve those problems with equity, reality and flexibility, within the industry—not in a manner wholly satisfactory to each party, but in a manner acceptable to all parties."

A long-term view of the situation was recommended to the industry by John R. Suman, vice president of The Standard Oil Co. (N.J.), who pointed out that in its effort to meet demand, the industry attained such momentum that it has been carried somewhat past its goal.

"Taking into account the inevitable time-lag between the blueprinting of new petroleum facilities and their completion, the wonder is not that oilmen sometimes overshoot or undershoot their mark, but that they hit as close to it as they do," he said. "The subsequent adjustments necessary to balance supply with demand are part of our jobs. Dealing with tasks like this is what society pays us for."

Discussing the import problem, he said, "there is at present a margin of productive capacity over current use of about one million barrels a day, and, to the extent that imports were reduced, we could begin digging into this spare capacity. But any desire to begin getting a return on this capacity should be balanced against the fact that our government regards this production reserve as a very important security measure against the event of war or other serious emergency. Last spring, in a letter to Senator Lyndon Johnson, Navy Secretary R. B. Anderson underscored the government's feeling when he wrote: 'It is estimated that the current U. S. daily production, including crude oil, distillates and gas liquids, is 7,059,000 barrels per day. The estimated daily production capacity if restrictions were removed is 8,159,000 barrels per day. This figure is not sufficient to meet the U. S. and Allied requirements in time of a national emergency.'

"Carrying this reserve capacity may sometimes seem irksome. But it is probably the only fair way to meet our responsibility to our country and, by so doing, meet our responsibilities to ourselves. The same opinion applies to refining. For along with spare productive capacity has gone a buildup in spare refining capacity about which apprehension has also been voiced. Yet when we consider that the excess refining capacity available today is only a little more than 10 percent above normal needs, and that the industry operated for many years in the pre-war period with a margin of 20 to 30 percent excess refining capacity, it would seem that the present margin is not unduly large.

"Despite the cutbacks made in several months of this year as against the immediately preceding months, domestic crude oil production for the year as a whole will average in the neighborhood of 6,500,000 barrels daily. This is approximately four percent higher than in 1952, which was itself a record year. This means that crude production in 1953 will set a new high mark in the industry's entire history. It's hard to see why we ought to complain about setting a record."

Mr. Suman pointed out that oil production has gone up about five times as much as population growth and half again as much as the increase in the nation's production overall. He showed that well completions this year to date are up about 5½ percent. The number of wells drilling at the end of September this year was up 32 percent over those drilling at the end of September 1952, and the year's total will probably be more than 47,000—a new record.

"Instead of taking counsel of our fears concerning the future, let us look at some carefully worked out estimates," he said. "In Jersey we believe that, even assuming a 10 percent drop in general industrial activity in the United States next year, the outlook is for a domestic consumption of oil three percent higher than the record consumption this year. The I.P.A.A. says it will be up 3.6 percent. These estimates compare with an annual growth of about six percent over the past 20 years. But remember that this outlook is in the face of an assumed decline on the part of industry generally. If such a decline does not occur, the increase in oil demand could be several percentage points higher. For example, a preliminary estimate of the Bureau of Mines for 1954, assuming no business recession, called for an increase of five percent.

"Looking further down the road, it seems that the oil market will continue for a long while to expand as it has so many years past. The recent Paley Report estimates that U. S. consumption will rise to a total of over 13 million barrels a day by 1975. This report also predicts that the rest of the free world will be using 13 million barrels a day in 1975 compared with the present daily total of about five million barrels.

"As a result of this anticipated upward trend of demand, the prospect is for continued growth of the domestic producing industry for some time to come. The recent Swearingen study published by the A.P.I., for example, estimates that domestic production will keep going up until, by 1967, we'll be producing at the rate of about 9,100,000 barrels daily—about 30 percent over the current output. The study indicates we may then begin to reach the peak of our ultimate discovery possibility and will have to look more toward the proved reserves of other areas as well as to improved secondary recovery methods at home. But the U. S. demand estimate of more than 13,000,000 barrels a day in 1975 seems likely to assure the domestic producer a constant and eager market for all the oil he can efficiently produce.

"Another element in the uneasiness that has been evident in the United States industry is worry about what may happen if Iranian oil returns to world markets. With the shutdown of operations there in 1951, new supplies of oil had to be found rapidly. Such supplies were found and, in an amazingly short time, the hole left by the sudden ceasing of the flow from Iran was filled. Today, when discussions looking to resumption of Iranian production are in progress, the question in many minds is: what will be the effect of this return at a time when oil supply from other sources is more than ample?

"In considering this question, one thing we should realize is that world consumption of petroleum increases each year by an amount roughly equivalent to the full production of Iran. Thus, for the past five years, growth of free world consumption required on the average an additional 700,000 barrels a day of new supplies each year. Against this fact, we must take into account that Iranian oil would not be spread out proportionately over all consuming areas. But, in the other pan of the scales, there is the factor of time. It is unlikely that Iranian production would come into the market in full tide overnight, so there would no doubt be time to prepare for its re-entrance. It seems to me that the very resilience which enabled the oil industry of the world to make up for the sudden loss of Iranian oil should enable the industry to cope with its restoration.

"These days it is pretty hard to talk about the subject of foreign oil without the question of imports coming up. Today the public is understandably confused by many conflicting stories. We hear descriptions of 'floods' of imports and 'torrents' of imports. As oilmen, of course, we recognize the basic difference in the kinds of oil being imported—that is the difference between imports of heavy fuel oil and crude oil. Imported heavy fuel comes chiefly into the eastern seaboard area, and the domestic refineries normally serving this market simply do not produce enough of this fuel to meet demand."

Bureau of Mines figures were quoted by Mr. Suman to show the ratio of crude imports to domestic crude production has not varied greatly in recent years. It was 10.8 percent in 1950, he said. In 1951, due to the abrupt shutdown in Iran, the ratio fell to 9.3 percent. Last year it went

(Please turn to page 80)

Battery of eight boilers employed for power on Rig 27 at Zubair.

THE ZUBAIR FIELD OF BASRAH PETROLEUM

By E. Lawson Lomax

BASRAH PETROLEUM CO. LTD. is one of the associated companies of the Iraq Petroleum Co. Ltd., but the working conditions of its Zubair field, from which current production is obtained, differ in many ways from those existing in the fields of the other associated companies.

In the first place, it is located within about 20 miles of the port of Basrah, on the Shatt-al-Arab, which has excellent port facilities with rail communications into the center of Iraq, while the town of Basrah itself is one of the most modern in the Middle East.

Prior to World War I, when the writer first visited it, the original home of Sinbad the Sailor was a small medieval town with few shipping facilities, located about eight miles from the Shatt-al-Arab, with communication to the river by small canals and creeks, but even at that time, a large part of the produce of Turkish Arabistan, such as dates and cereals, was shipped from it to the amount of about 400,000 tons per annum. This merchandise had to be lightered out to ships lying in the Shatt-al-Arab, and the draft of these vessels was limited to a maximum of 20 feet owing to the bar at the mouth where it joins the Persian Gulf.

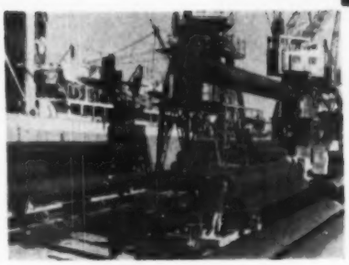
Incidentally, this bar placed similar restrictions on the loading of tankers at the Abadan refinery of the Anglo-Iranian Oil Co., the tankers being partly loaded at Abadan and completing their cargoes from lighters at Fao, below the bar.

It can be said that World War I was directly responsible for the development of the port of Basrah and for modernization of the town itself.

When the Mesopotamian expedition was launched, work was begun to develop the water port of Margil as a military port for the discharge of troops, ammunition and equipment. After the war, and the advent of Iraq as an independent nation, the port with all its equipment was transferred to a commercial administration. The Port Directorate drafted regulations and became a self-supporting unit.

One of the first problems confronting the Directorate was the provision of storage accommodation, such accommodation

New Basrah Petroleum Co. general management offices overlooking Ashar Creek in Basrah.



Basrah Petroleum Co. docks are served by meter-gauge railway trucks which transport incoming equipment to vast marshalling yards.

not having been required or built by the military authorities who transferred supplies direct from ship to sail for immediate dispatch. Seven large sheds and several smaller sheds were built for this purpose by 1922, but the problem of draft of ships able to use the port remained.

In 1924 it was decided by the Port Directorate, with the backing of the Iraq government, to dredge a channel 28 feet deep and 300 feet wide through the bar at the mouth of the Shatt-al-Arab. This project, creating what is now called the Rooka Channel, was completed six years later, and the depth of the channel was increased to 30 feet to allow the passage of the then largest sized tankers. Later the depth was increased to 32 feet.

When World II began the port was handling about five million tons of shipping per year and was efficiently organized to handle the influx of war materials sent by the Allies as part of the "Aid to Russia" scheme.

At present the port has eight timber wharves with a total length of over 4,500 feet, and two lighterage wharves with warehouse accommodations for over 50,000 tons of cargo and adequate unloading equipment. A large amount of the 30-32-inch pipe for the Kirkuk-Banias pipe line was unloaded at the port, as well as the pipe for the 12 and 24-inch lines from the Zubair field to Fao. Five dredgers are continuously at work, keeping the deep water channel at the mouth of the river open for ocean-going vessels.

The town of Basrah has grown since the first World War from a small village to a large modern township, with a large airdrome, railway station, municipal buildings, wide streets and modern dwellings, being in fact one of the most modern communities in the Middle East.

A large number of the personnel, both imported and Iraqi, of the Basrah Petroleum Co. is at present living in Basrah, occupying rented houses. Arrangements are in hand with the Basrah municipality for construction of a housing estate for Iraqi and European personnel, including club and recreation facilities.

In addition, houses are being built for non-national personnel at Barjisiya on the west flank of the Zubair field, and an-

The dredger "Basra" at Fao engaged in maintaining proper channel conditions for tankers and supply vessels.

Lowering 24-inch pipe into the 4½-foot deep trench near Abu Flus during construction of the new Zubair-Fao line.

Loading manifold at Fao where tankers are loaded at the rate of 14,000 barrels per hour. Two new jetties have been under construction to double previous loading capacity.

On-shore boiler plant employed to supply steam to tankers and for loading operations at the Fao port.

Tanker "Rampao" prior to sailing with crude from Fao terminal. Before the recent increase in pipe line and loading capacity, some 20 tankers per month were loaded.

A drilling rig in the Zubair field.

other housing estate for nationals on the outskirts of Zubair village about three miles from the field.

At Fao, the tanker loading station at the head of the Persian Gulf, housing estates for both classes of personnel are being built. Much of the company housing for staff is being air conditioned.

As mentioned previously, the Zubair field is located about 20 miles southwest of Basrah and about 80 miles north of the Burgan field of the Kuwait Oil Co. For many miles around Zubair there are no surface indications of the underlying geological structure, the country being either flat desert or marshes, the latter under water during the flood season. As a result of intensive geophysical and seismic surveys, evidence was obtained of the existence of broad flat structures which appeared to be possible reservoirs of petroleum. Exploratory drilling was commenced in February 1948 at Zubair and at Nahr Umr, 30 miles northwest of Basrah, in March 1948.

The Zubair exploratory well had shows of heavy sulfurous crudes at shallow depths which were not commercially attractive, so the well was continued to about 11,100 feet. From 10,500 feet to 11,100 feet three pay horizons were struck, capable of giving commercial production.

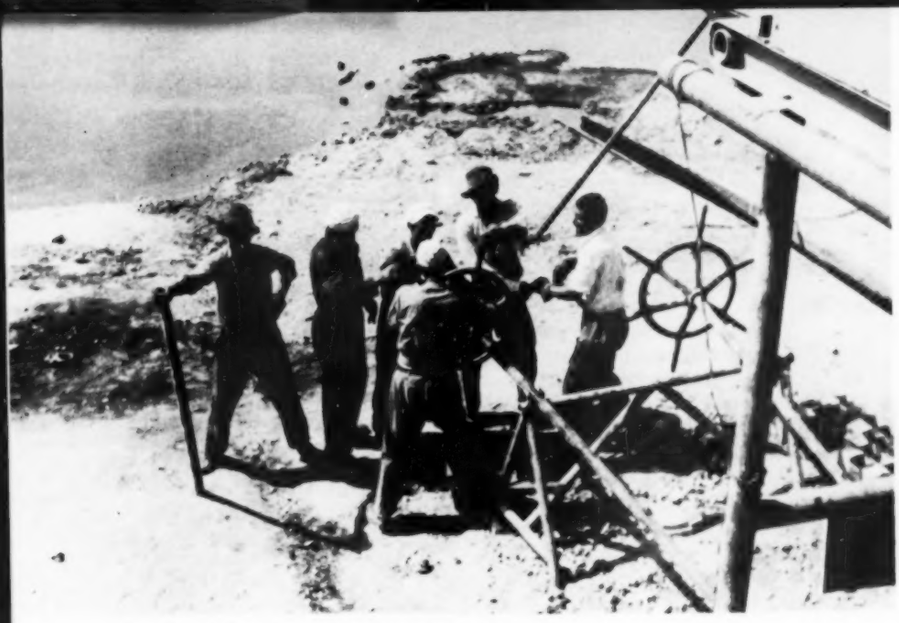
The structures encountered during drilling are as follows:

(a) Surface gravels and sands.

(b) Lower tars, gypsum, clays and limestones.

(c) Second gravel and sand sequence.

At 2,000 feet a large sequence of limestone begins and at 2,600-2,700 feet a small sequence of anhydrite is followed by limestones and marls to about 9,000 feet. At 9,000-11,100 feet a series of sands and shales occurs, divided by a thick series of limestones at about 10,-100 feet. The producing horizon at 10,-500-11,100 feet has alternating sand and shale. Production at present is being



Remote well-head control in the Zubair field.

taken from the third of the three pay horizons.

This field is therefore the deepest producing field in the Middle East. The producing horizon is about four times as deep as that of the Kirkuk field and more than twice as deep as the Kuwait and Saudi Arabian fields.

As presently defined, the length between the extreme wells is about 36 kilometers. The field is being drilled on a triangular spacing of the wells, with a distance of two kilometers between them.

When production started at the end of 1951, a dozen wells had been drilled and five more were drilling; by the end of 1952 ten more wells had been completed and six others were drilling. Cumulative production of the field by the end of 1952 was 2,353,146 tons.

In contradistinction to the other producing fields of the Middle East, the crude from the Zubair field, although containing 1.9 percent by weight of sulfur, has no free sulfuretted hydrogen and therefore can be classed as sweet. After degassing, the oil for export has the following approximate specifications:

Specific Gravity at 60° F.	0.8515
Gravity (API)	35°
Viscosity at 40° F.	21.0 centistokes
" " 80° F.	9.1 "
" " 120° F.	5.9 "
Sulfur content	1.9% (weight)
Asphalt	0.5% (")
Oil sweet, contains no H_2S.	

ENGLER DISTILLATION

IBP	47° C.
Distilling at 75° C.	2.5% Volume
" " 100° C.	7.0 "
" " 125° C.	13.0 "
" " 150° C.	19.5 "
" " 175° C.	25.5 "
" " 200° C.	31.0 "
" " 225° C.	37.0 "
" " 250° C.	40.0 "
" " 275° C.	45.0 "
" " 300° C.	50.0 "

Each well has its own gathering line, the size of which is regulated according to the distance of the well from the degassing station; the lines vary in size from three to four inches and there is a combination of 4-6 inch lines. At the head of each well is an automatic device whereby the well can be closed down should there be any excess variation in the gathering line, but this arrangement may later be transferred to the gathering station.

The gas/oil ratio on production is an average of 800 c.f. per barrel and remains very uniform.

At present only a certain number of wells are being produced in order to give about 59-60,000 barrels of degassed crude per day, this being the maximum capacity of the existing 12-inch crude line to the loading port at Fao, 70 miles away.

The degassing plant is a vertical one, with three pressure stages, but the intention is to add two further stages later. It was designed for 65,000 b/d.

The gas from the HP separator is piped to the pump house where it is used to drive conventional slush pumps charging the line to Fao, the exhaust gas from these pumps being burned at flares. The pumping pressure during the day is 950 psi, but as the line is exposed over its whole length, this pressure drops during the night and pump strokes are reduced to maintain a steady discharge.

The 12-inch pipe line to Fao, 70 miles long, is built on concrete piles and passes along the edge of marshy ground close to the road so that there is access to it during the rainy season. It is not wrapped, and the only protection against corrosion is painting. There is no necessity for protection against internal corrosion as the crude is sweet and non-corrosive, and, as it is not in contact with the ground, external corrosion is only that due to weather.

The terminal at Fao is fully equipped for the loading of ocean-going tankers. At present there are two oil-loading jetties which are equipped with Baker fenders and modern plant for hose handling. The loading pumps are capable of loading tankers at the rate of 2,000 tons per hour.

In the power house there are three 640 kva generators, driven by National diesel engines, a small boiler house to supply shore steam to tankers for their auxiliaries, a water treatment plant with a daily capacity of 120,000 gallons and air conditioned living quarters both for imported and local staff.

The pumping station at Zubair and the terminal at Fao were officially opened in January 1952 by the Prime Minister of Iraq, H. E. Nauri Pasha El Said.

The Zubair field is now producing to the limit of its present exporting capacity, but work on the field, de-gassing plants, pumping stations and ocean terminal is being pushed forward to bring the production to eight million tons yearly by the end of 1955, in accordance with the agreement entered into between the company and the Iraq government. This entails, in addition to the continued drilling program on which six rigs are at present working, an increase in the number of degassing stations, in tank storage, power generation, pipe line capacity, terminal storage and berthing facilities.

The program calls for two more degassing stations, each gathering from 15 wells, with pumping capacity to pump the de-gassed oil to the central pumping station at the receiving end of the new 24-inch pipe line. The new de-gassing stations are temporarily to be vertical ones until horizontal de-gassing plant is available.

For power generation three 2,500 kva turbo-alternators, which are now redundant at Kirkuk, will be moved to Zubair and a new boiler plant will be erected. One of these sets will be used to supply power for the pumps to the new line. Another will be used to supply the domestic load and the third set will act as stand-by.

A new 24-inch line from Zubair to Fao has now been built, final tie-in having been made in August. This line is shorter than the present 12-inch line, as it has taken a direct route over the marsh country to Fao. It is buried and wrapped and supplied with cathodic protection. The company has had so much experience in pipe laying that it felt justified in taking this course, even though at certain periods the line is inaccessible. The pipe has been laid in four directions: Zubair to Cerba, midway between Zubair and Fao, and from Cerba to Zubair, in the other direction from Cerba to Fao and from Fao to Cerba.

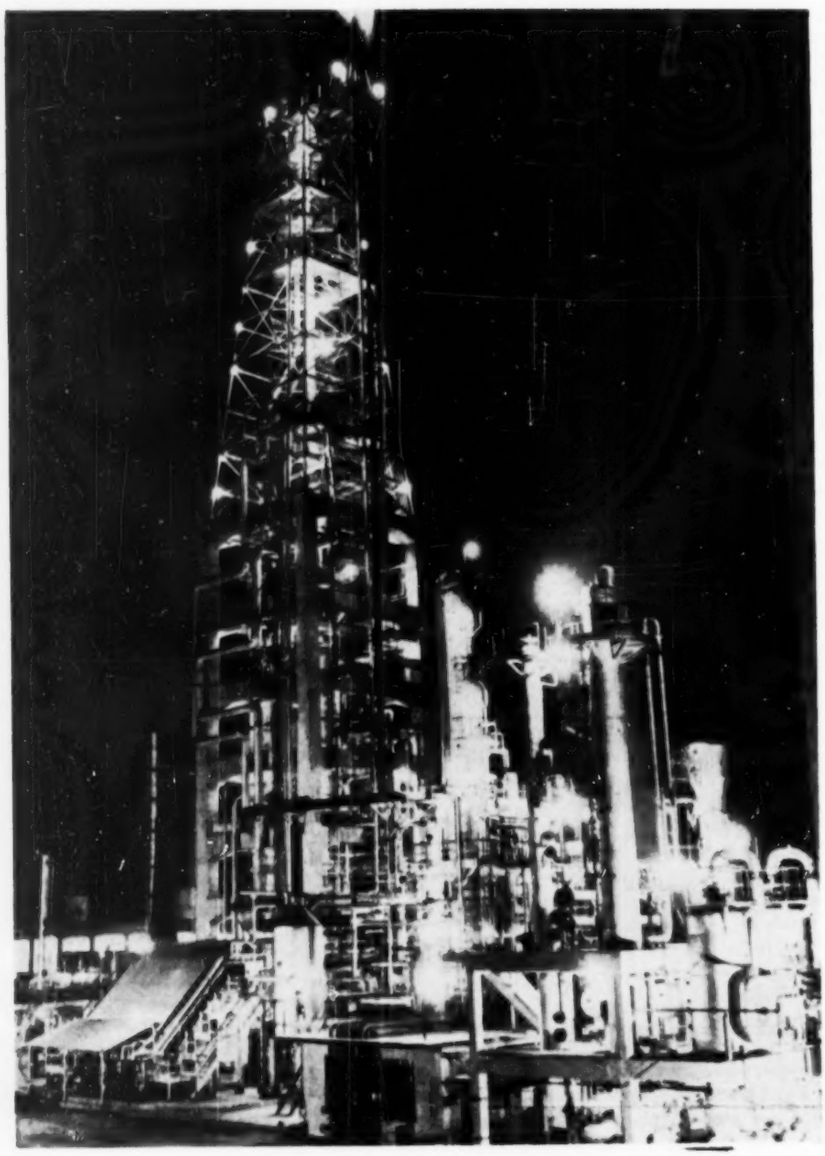
At the Fao terminal twelve additional 160-foot diameter by 36 foot high floating roof storage tanks are to be erected with a capacity about 500 tons per foot, which will increase the terminal storage capacity by over 200,000 tons.

Two further loading jetties are to be added, the first of which is in course of erection and is expected to be completed this year.

Italian refineries install midget airlift crackers

By G. A. Caldana

The Rome plant at night.



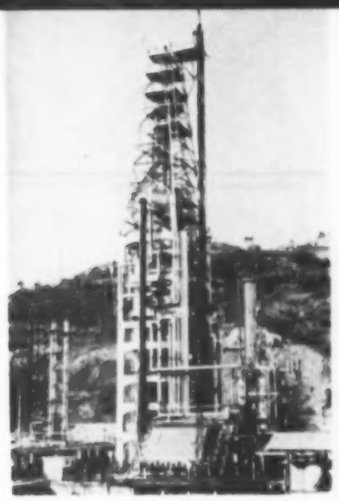
TWO SMALL Italian refineries, confronted with the problem of revamping their facilities to meet competition, have installed catalytic cracking units of the smallest size built so far. This article briefly discusses some of the reasons which determined this decision and describes the results achieved during approximately one year's operation.

Permolio S.p.A. is an Italian independent oil refining company with three refineries: at Milan, Genoa and Rome. At the end of World War II these refineries had a crude capacity of approximately 2,500 barrels each. The activity of the Milan plant was largely in the lubricating oils field. At Genoa and Rome, on the contrary, there was practically nothing but several small atmospheric distillation units, chemical treating of distillates and asphalt blowing facilities. The conditions of other Italian refineries was not much better, due to the war which had severely damaged their equipment and prevented any progress. It was clear, however, that the large companies would immediately start extensive programs to revamp and expand their facilities. Soon, therefore, competition would become very difficult to be met by two small obsolete refineries like the Permolio ones, unless something was done to improve substantially the quality of their products and decrease their operating costs.

The new facilities required should give high yields of valuable products of the best quality. Catalytic cracking was thought to answer this requirement. Operation should not be too difficult, because of the limited experience of the available personnel, and should be as flexible as possible, since the life of the whole refinery would be centered around this one unit, contrary to what happens in the average refinery where for every situation there is a choice of units and processes.

After carefully examining all aspects of the problem, the operators chose the TCC

G. A. Caldana is technical manager of the Permolio Company. He received his chemical engineering doctorate from the Politecnic School of Turin. Immediately after the war, during which he spent two years in a German internment camp, he worked for the engineering department of the Michelin tire manufacturing plant. Afterwards he joined the Permolio Company as chief chemist of the Milan refinery and later as assistant chief engineer in the main offices.



The Genoa plant.

process. The Socony-Vacuum Oil Company, Inc., which had originally developed this process, had just then (1950) released the new "Airlift" type, easier and simpler to operate than the original designs (which were already noted for this feature) and with the greatest flexibility attainable in catalytic cracking. A particular stress had been put by the licensors on the suitability of this process to the smallest sizes; in fact, they were themselves engineering a 3,000 barrel "packaged" unit.

For the Permolio refineries, however, a size even smaller was required; each unit was in fact designed to run 1,210 b/sd of Middle Eastern crude gas oil derived from a mixture of whole and reduced crude, plus 420 b/sd of recycle while burning 1,100 lbs/hr of coke.

The units were designed by the Foster-Wheeler Corp. Most of the design of the catalytic section (including engineering of vessels) was performed by the Socony-Vacuum refinery engineering division. Detailed drawings for piping, foundations and buildings were developed in Italy by the Permolio staff under the supervision of Foster-Wheeler engineers.

A large portion of the equipment for these units was built by Italian manufacturers, while special materials (like instruments, compressors, blowers, high alloy castings, etc.) were purchased in the United States. The necessary American funds were made available by the ECA, which granted the sum of $1,534,000.

The units were erected by local contractors under the supervision of Foster-Wheeler and Permolio engineers. Construction was started in the middle of 1951 and completed in the second part of 1952. The Rome unit was started on August 15, 1952 and the Genoa one on December 1, 1952.

A simplified flow-sheet of the two TCC units is shown herewith. The fresh feed, which can consist of two different streams (originally reduced and whole crude, at present Middle East reduced crude and Venezuela distillates), is pumped through the preheat exchanger section, mixes with the recycle and passes through the heater. The combined feed leaves the heater at approximately 850°F and is flashed in the tar separator at about 10 psig. Although no reflux is provided for this tower (which of course has no trays) the overhead product, which enters the reactor as vapor feed, is very clean as proved by a Conradson carbon residue always under 0.2.

The heavy bottoms from the tar separator pass under tower pressure to a small vacuum flash tower operating at a pressure of approximately 40 mm Hg absolute. The flashed heavy gas-oil is condensed in the top of the tower by a circulating reflux stream and the net product is pumped through a fired heater to the reactor liquid feed nozzle. No stripping with steam is provided in this tower. The bottom product is a heavy tar which is burned as such in the unit itself or blended into the fuel oil produced at the refinery.

In the reactor the hot catalyst contacts the liquid and vapor feed, cracking and vaporizing the liquid feed and raising the vapors to cracking temperature. The catalyst circulation is normally about 52 tons/hr. The reactor operates at a pressure of approximately 9 psig at the top and 8 psig at the base, where the oil vapors enter the transfer line to the fractionator.

The spent catalyst from the reactor flows by gravity to the top of the kiln. The combustion air enters the catalyst bed around the middle of the kiln and flows partly downward, partly upward. In this way burning temperatures are kept under control (below 1,300°F) and at the same time almost complete combustion of the carbon is attained (carbon on the regenerated catalyst is 0.07 percent). The flue gases resulting from the combustion are disengaged at the top and bottom of the kiln and vented through separate stacks. The kiln is designed to burn 1,100 lbs/hr. of carbon.

The regenerated catalyst is cooled in the external catalyst cooler where the combustion heat is used to generate steam. The cooled catalyst flows to the lift pot and is lifted by hot air, at about 2 psig, to the top of the unit, where it is disengaged from the conveying air and collected in the separator surge hopper.

A small stream of catalyst, approximately one ton per hour, is continuously withdrawn from the separator surge and passed to an elutriator where the undersized particles are removed by a stream of high velocity air.

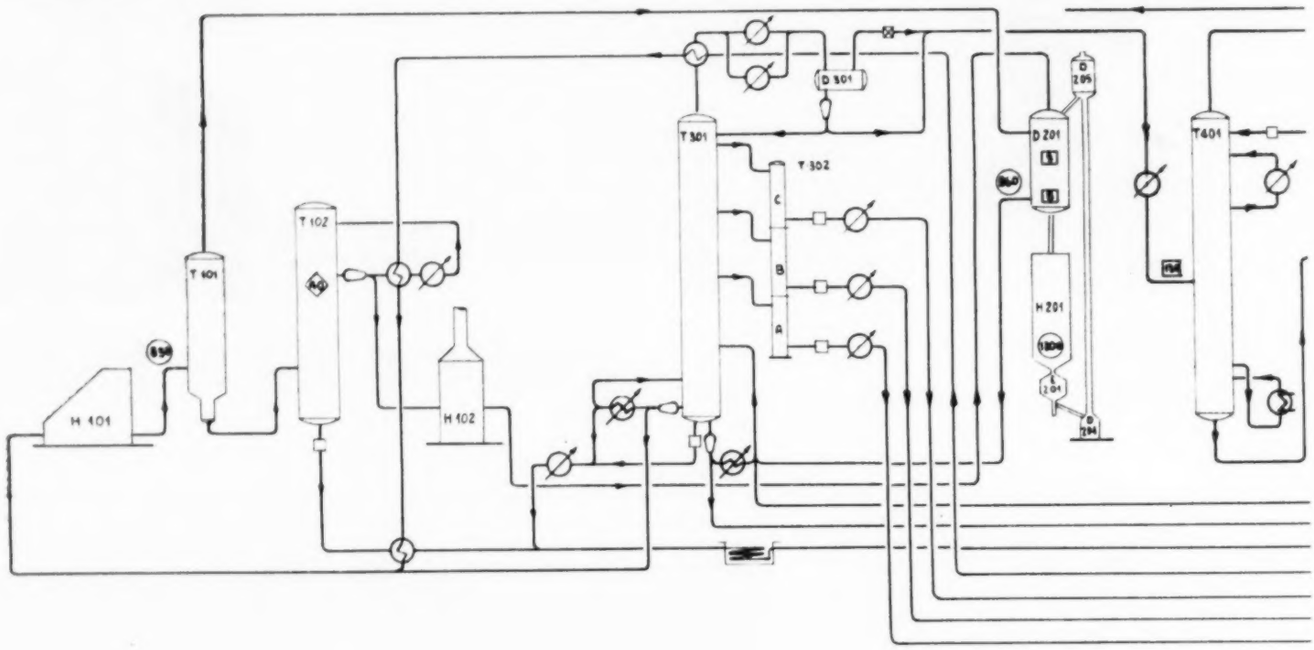
Oil vapors, which leave the reactor at about 860°F, are quenched in the transfer line by fractionator bottoms. The quench heat is used in the debutanizer reboiler and to generate steam.

The fractionator is provided with three side stream strippers (for naphtha, tractor fuel and gas oil). An intermediate reflux is circulated in the section under the gas-oil draw-off and the heat removed is used to generate steam. The recycle is taken as a sidestream several trays above the flash zone and returned to the heater.

The overhead from the fractionator is condensed through an exchange with the fresh feed and two water coolers in parallel. Originally only one cooler was installed but the gasoline temperature was excessive (125°F) so a second one was added in parallel with the first one. The condensed unstabilized gasoline is pumped partly back to the fractionator as reflux and partly to the gas plant, while the uncondensed gases are taken by the gas compressors.

The gasoline and the compressed gases are mixed together, cooled and fed to the deethanizer, which operates at about 130 psig. Depentanized gasoline from the debutanizer is used as absorbing medium, while the bottoms of the tower are reboiled with steam to remove most of the absorbed ethane. An 85 percent recovery of C_2's with a very low ethane contamination is possible with this arrangement.

The deethanizer bottoms are fed to the debutanizer which should separate a C_3-C_4 overhead, a stabilized gasoline and a depentanized lean oil. Under normal loads, however, this was not possible and a sta-



H 101	TAR SEPARATOR HEATER	H 201	KILN
T 101	TAR SEPARATOR	D 201	REACTOR
T 102	VACUUM FLASH TOWER	E 201	CATALYST COOLER
H 102	LIQUID FEED HEATER	D 204	LIFT POT
T 301	FRACTIONATOR	D 205	SURGE SEPARATOR
D 301	FRACT. REFLUX DRUM	T 401	DEETHANIZER
T 302	STRIPPERS	T 402	DEBUTANIZER

Flow diagram of TCC unit.

bilizer was added which completes the separation of the excess butanes from the gasoline. The latter is caustic washed in two counter-current stages, resulting in quite a low Copper Number for the gasoline (under 5). Since the prevailing specifications require a negative Doctor test, Doctor treatment is necessary and is now performed batchwise until a continuous treating plant, now under construction, is completed.

The debutanizer and stabilizer overhead products are treated by a Shell tri-potassium phosphate system, which had to be supplemented by a final caustic wash since the LPGas specifications call for the complete absence of H_2S and a low content of mercaptans. The desulfurized product is sent to storage as mixed LPGas or separated into C_3LPGas and C_4LPGas in the depropanizer. The latter tower was used to stabilize the gasoline from the debutanizer until the stabilizer was installed.

Operation of the two units has been characterized by frequent changes in charge stock: Damman, Iraq and Kuwait reduced crudes are each run for a period during every month. Very often a long distillate obtained from the Venezuela crudes used for asphalt manufacture is blended into the reduced crude. The length of the latter is also sometimes varied; for a high gasoline yield a long residue is best suited. On the Italian market, however, there is a high demand for high grade diesel fuels and often the charge to the cracker is what is left after getting as much diesel fuel as possible from primary distillation. Originally a whole crude operation had been planned. This, however, would have led to a low octane rating for the cracked gasoline. This type of operation is therefore used only on start-ups.

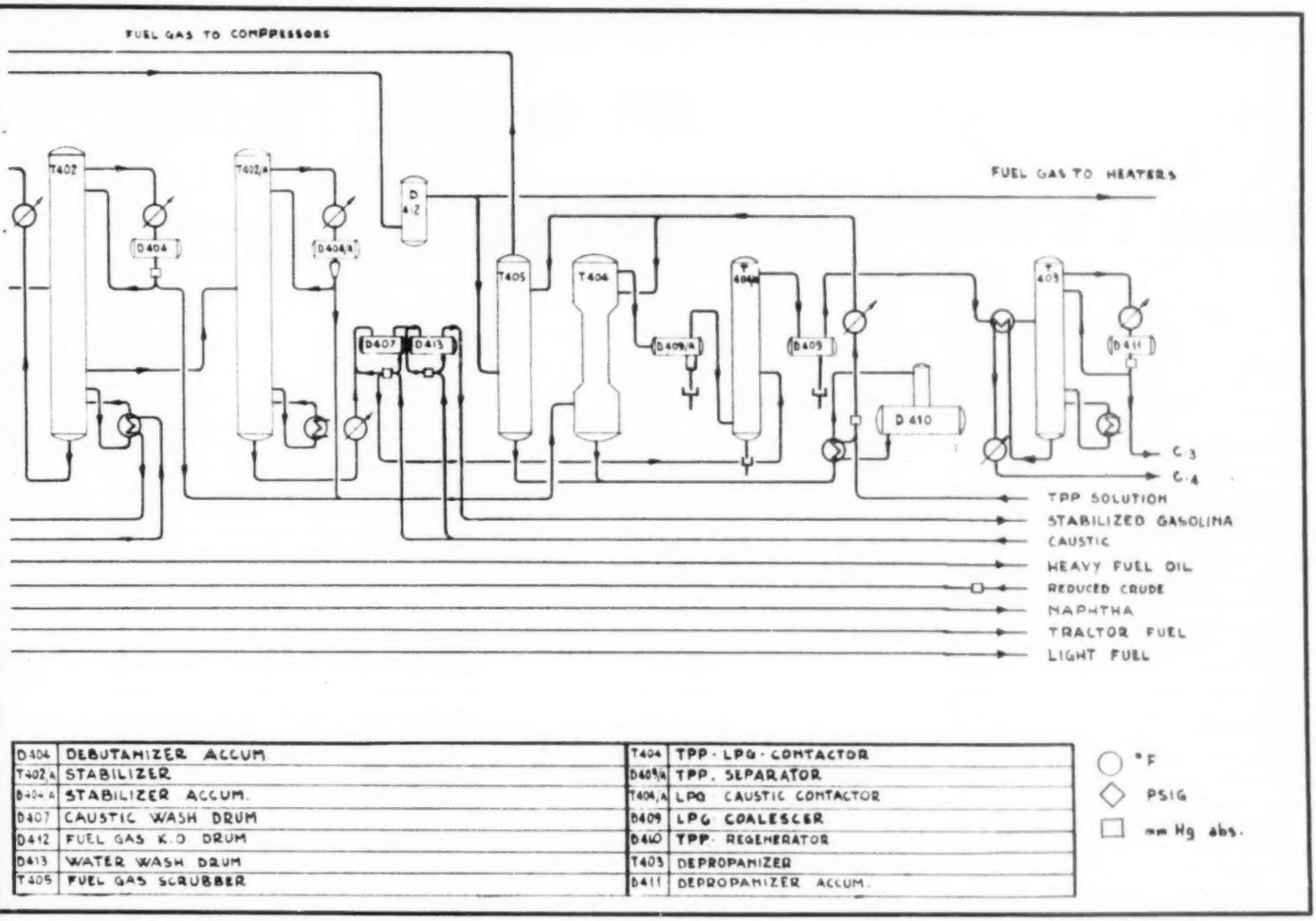
Typical yields for different types of operation are indicated in Table I. These yields are in fair agreement with what was originally expected. Lower than usual LPGas yields were experienced particularly when running Venezuela distillates.

The catalyst consumption on these units has been very low, in the order of 0.3 ton/sd. Under these conditions equilibrium has been reached on a 28-29 activity level. The units were started up on Socony bead catalyst from Paulsboro, N. J. The same catalyst has been used so far for make-up. Consideration is now given, however, to the possible use of bead catalyst manufactured in Germany under Socony license by Kali-Chemie, A.G.

A critical utility situation was experienced when the Rome unit was first started. Up to 14 power failures took place in six days and the reactor was correspondingly by-passed eight times. In the overall, however, it stayed off stream only 23 hours, with an 84 percent on stream efficiency, which under those conditions was remarkable. This really proved the ease of operating an airlift TCC unit and its ability to recover from upsets.

In particular it can be stated that the catalytic section, once on stream, requires very little attention. An elaborate system of controls, alarms and interlocks assures the necessary protection in case of emergencies and the operators almost forget this section to devote themselves to the rest of the plant, which even though apparently simpler, nevertheless gives much more trouble.

Maintenance of the units during this first year of operation has presented no special problems. Erosion by the catalyst in the lower section of the lift pipe has



D404	DEBUTANIZER ACCUM	T404	TPP · LPG · CONTACTOR
T402/A	STABILIZER	D409/A	TPP. SEPARATOR
D404/A	STABILIZER ACCUM.	T404/A	LPG CAUSTIC CONTACTOR
D407	CAUSTIC WASH DRUM	D409	LPG COALESCER
D412	FUEL GAS K.O DRUM	D410	TPP. REGENERATOR
D413	WATER WASH DRUM	T403	DEPROPANIZER
T405	FUEL GAS SCRUBBER	D411	DEPROPANIZER ACCUM.

○ °F
◇ PSIG
□ mm Hg abs.

taken place at an exceptionally quick rate, so that in both units replacement of about 30 feet of pipe was necessary. The lift pipe is fabricated with carbon steel plates and the use of a harder material (a high chromium-content cast iron centrifugally cast inside a steel shell) is being considered.

For the internal insulation of the kiln a locally manufactured slagwool was used. This material, however, failed under the high temperatures prevailing in the kiln, causing very high heat losses through the walls of this vessel (outside metal temperatures up to 450°F.) and consequently a decrease in steam production. At the first turnaround the slagwool will be replaced with baked insulating bricks. The corrosiveness at temperatures above 600°F of the sulfur material encountered in Middle East crudes was well known and the towers were lined with stainless steel wherever temperatures higher than this limit were expected. This could not be done, of course, with the lines to and from these towers and corrosion of these pipes has taken place, requiring replacement of most of them after a year of operation.

To summarize, it can be stated that the Permolio experience with the TCC process has been quite satisfactory and the expected goals have been reached. The company can now market under its own brand name (Octangas) a 91-93 octane premium and a 78-80 octane regular gasoline which can compete with the best brands available, while the refinery economics have been substantially improved by the better yield pattern.

TABLE 1

TYPICAL YIELDS WITH DIFFERENT CHARGE STOCKS

Type of Charge	Total Charge to Reactor	Recycle Weight % on Fresh Feed	Yields (Weight % on fresh feed) LPGas	Fuel Gas	Gasoline	Cycle Stock	Coke
Kuwait Crude 46-70% heartcut	1050 b/sd	27%	15.6	5.75	42.2	28	7.2
Iraq " 57-78% "	1120 b/sd	16%	12	3.95	37.5	36	5.1
Arabian " 55-80% "	1200 b/sd	31.5%	11.5	4.50	43	30.5	10.5
{Kuwait " 46-70% " / {Bachaquero " 10-56% " (50-50 mixture)	1200 b/sd	34%	12	4.3	42	34	5.6

Operating Conditions: Space Velocity 0.8
Catalyst to Oil Ratio 7
Inspection of Products: Gasoline—Gravity 65° API; 90% B.P. 350° F
End point 400° F; O.N. clear 80 MM. 91 RM
Whole Cycle Stock—Gravity 20.5° API
Light Gas Oil cut (410°-630° F Boiling Range)—26.5° API

Canada's production up 33 percent

By J. L. Irwin

PENDING COMPLETION of final figures of Canadian oil production for the first nine months of 1953, the Department of Mines and Technical Surveys, Ottawa, has released a table giving estimates of totals for this period.

Estimated yield for the first three quarters of the year is 57,880,100 barrels to compare with 43,679,762 for the same period in 1952, an increase of 14,200,338 or approximately 33 percent. Alberta supplied 55,174,300 barrels toward the total in 1953. Since the early days of Turner Valley, some 20 years ago, Alberta each year has produced well in excess of 90 percent of Canada's oil output.

Western Canada's proved crude oil reserves are now in the neighborhood of two billion barrels, a decided change from the 45-million barrel reserve when the Leduc field appeared on the scene. Natural gas reserves, with no present market beyond the limited home demand within Alberta, have moved in the same period from 1½ trillion to around 14 trillion cubic feet, one half of the latter figure having appeared within the past two years.

The table of production for the first nine months of 1953 and 1952, the former totals being estimated and the latter final, is as follows in barrels of 35 imperial gallons:

	1953	1952	INCREASE OR DECREASE
New Bruns.	11,300	10,637	+663
Ontario	171,300	146,039	+25,261
Manitoba	406,500	27,185	+379,315
Sask.	1,889,300	1,215,511	+673,789
Alberta	55,174,300	42,029,450	+13,144,850
N. W. Terr.	227,400	250,940	—23,540
Total	57,880,100	43,697,762	+14,200,338

From official figures of Alberta oil production for the eight months ending August 31, the accompanying table, showing output of the 29 most prominent Alberta fields arranged in order of their importance and showing increase or decrease as compared with 1952, has been compiled.

Redwater still leads in production, but its boundaries are now determined, limiting further expansion, while bottom hole pressures have lessened, resulting in decreased production. Water pressuring to solve this problem is under consideration. In comparision with the field's production total, however, the decrease is small.

Leduc-Woodbend is now only 1,258,823 barrels behind Redwater. This field is still expanding in area, and by August 31 it had 1,197 producing wells to compare with Redwater's 927. Leduc has many D2 wells carrying smaller production allowables than the D3, which explains the difference between the two fields, as Redwater's wells are all D3. In the near future it is possible that Leduc-Woodbend may return to its former top position in the province.

It will be noted that all fields show increases except Redwater, Turner Valley, Stettler, Conrad and Taber. Conrad and Taber are old fields dating back more than 20 years.

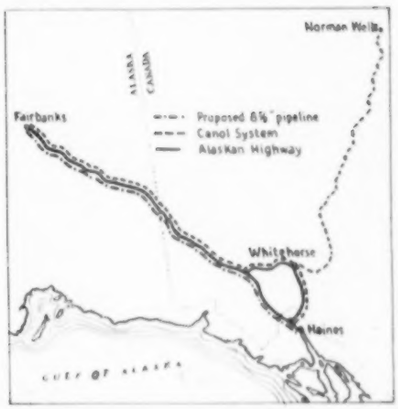
Bonnie Glen, a newcomer, from only 66 wells had climbed to third place among Alberta's producers by August. Armena-Camrose, with 251 wells, was fourth. Wizard Lake came fifth and Acheson sixth. Fields with outstanding increases are Leduc-Woodbend, Bonnie Glen, Armena-Camrose, Wizard Lake, Acheson, Fenn, Westerose, North Big Valley, Malmo, Duhamel, and West Drumheller. Wainwright, second oldest field in Alberta, is expanding again. Among new arrivals South Camrose and St. Albert look promising. While showing only a small increase, Lloydminster continued its important expansion in the black oil area.

1952 AND 1953 OUTPUT OF 29 PROMINENT ALBERTA FIELDS

Field	1953	1952	Increase or Decrease	Field	1953	1952	Increase or Decrease
Redwater	14,891,359	15,245,403	— 354,044	Malmo	434,800	80,027	+ 354,773
Leduc-Woodbend	13,632,536	11,378,568	+2,253,968	Duhamel	337,260	192,238	+ 145,022
Bonnie Glen	2,798,628	255,864	+2,542,764	Stettler	265,260	320,846	— 55,586
Armena-Camrose	2,191,335	498,871	+1,692,464	West Drumheller	251,193	———	+ 251,193
Wizard Lake	1,781,638	925,730	+ 855,908	Glen Park	241,122	181,358	+ 59,764
Acheson	1,609,052	1,154,264	+ 454,788	New Norway	208,036	184,419	+ 23,617
Turner Valley	1,596,180	1,781,788	— 185,608	Drumheller	172,497	103,841	+ 68,656
Golden Spike	1,245,522	792,907	+ 452,615	Conrad	84,657	91,201	— 6,544
Joseph Lake	815,319	667,780	+ 147,539	Jumping Pound	62,679	44,053	+ 18,626
Lloydminster (Alberta Side)	726,399	686,023	+ 40,376	Namao	56,348	16,752	+ 39,596
Fenn	698,649	150,765	+ 547,884	South Camrose	48,900	7,328	+ 41,572
Excelsior	643,893	583,571	+ 60,322	Stanolind Imp. St. Albert Unit 1 well	48,829	———	+ 48,829
Westerose	541,245	947	+ 540,298	Taber	45,464	56,899	— 11,435
Big Valley	516,329	372,312	+ 144,017	Wainwright	40,313	13,521	+ 26,792
North Big Valley	448,485	3,437	+ 445,048				

The total number of producing wells in Alberta as of Aug. 31 was 4,311.

CONTRACT AWARDED FOR STRATEGIC ALASKAN LINE



Route of new Haines-Fairbanks oil pipe line.

By Joseph Huttlinger

A NEW MILITARY OIL PIPE LINE linking Canada and Alaska is assured by the award of a $30 million construction contract to a group of private pipe line contractors. The time table calls for an immediate start on the job and completion by September 1955.

The line will run from Haines, an ice-free port in southeastern Alaska, and will travel across Canada for 280 miles on its rugged 615-mile course, hugging the Alaskan Highway and its continuation in the Haines cutoff motor roadway. Fairbanks, Alaska, is the northern terminal.

A safe route for jet fuel, aviation gasoline and other military products for U. S. air bases in central Alaska is the main reason for the line. Ladd and Eielson air force bases are near Fairbanks. Any surplus of capacity, and there is expected to be some in peacetime, could be used to carry civilian gasolines and heating oils into the remote northern territory.

Many years of planning went into the project. The U. S. military, which is paying the full cost, spent years persuading Congress that the project is needed. Design and surveys for the line took two more years. Negotiations with the Canadian government came to a formal agreement only last August. Finally, invitations to bid were sent out and drew three offers to construct the line.

The successful bidder, as disclosed with the award of a contract early in November, along with a notice to proceed with the work at once, came from three companies jointly, as follows: Williams Brothers Co., Tulsa; McLaughlin, Inc., Great Falls, Mont.; and Marwell Construction Co., Vancouver, British Columbia. Williams Brothers Construction Corp. of Canada is to get a subcontract for part of the pump stations and terminals to be built in Canada.

The line and its 50-foot right of way, 30 feet of which must be cleared of trees and shrubs, will cross mountains, rivers, canyons and miles of treacherous muskeg swamp. Starting and ending at about sea level, it will rise as high as 3,800 feet in the first 100 miles going northward, with each major rise along the route coming immediately after a pump station. Much of the route will be under the shadows of the 14,000 and 16,000 foot peaks of the St. Elias and Wrangell mountain ranges. A total of 435 miles must be laid on permafrost, the perpetually frozen earth of the Arctic, concerning which engineers have much to learn. The rest of the line will be buried.

Here are the vital details, as set out in the specifications:

Terminals:	Haines, Alaska and Fairbanks, Alaska
Length:	615 miles
Size:	8⅝ inches
Bid Price:	$29,001,287
Starting Date:	November 1953
Completion Date:	September 1955
Pipe Wall:	.227 to .322 inches
Haines Storage:	190,000 barrels in 9 tanks
Capacity:	Minimum of 9,600 b/d jet fuel at 20° below F.

Full details on capacity have not been disclosed, but the specifications set out that the pipe line system must be able to pump 400 barrels an hour of jet fuel of .8205 specific gravity at a temperature of minus 20 degrees Fahrenheit. This comes to 9,600 barrels a day. The normal capacity of a pipe of this size in the United States is close to 30,000 barrels daily for petroleum products.

A total of five pumping stations is planned at this time, it is understood, but their capacities are not disclosed by military authorities directly. A total of $10,950,000 of the cost is to go for this item, or more than one third. The total pipe line cost is estimated at $17,342,624, and the Haines terminal wharf at $708,664.

A wealth of detail about the pipe line is set out in the records at the U. S. Corps of Engineers. Thus, the cost of the steel pipe alone is to come to $8,589,705 under the plan of Williams to use European pipe for the Canadian part of the line and seamless tube from National Tube Co. for the Alaskan part of the route. The "Buy American" act forbids use of foreign materials on government projects unless the saving is 25 percent or more, which is not possible in this case, said Williams. Use of electric welded pipe from Kaiser Steel Corp. at a saving of $16 a ton, mentioned by the Williams bid, was rejected by the engineers.

A total of 34 rivers and streams is to be crossed, for a cumulative distance of 20,900 feet of major crossings and 18,000 of minor river crossings, at a cost of $735,000. The highway crossings will add up to 9,000 feet, costing $140,350. Thick marshes of 25 miles add to the problems.

To clear and grade the entire route is to cost an estimated $1.7 million, and to string the pipe an equal amount while laying it is estimated at $1.9 million. The cost of construction adds up not only because of the pioneering nature of the venture, but because wage rates in Alaska and Western Canada are high, running up to $4 an hour for some types of work. Shelters must be built and food, clothing and other essential needs flown in by air or carried in by truck along the Alcan highway.

A depot at Haines is to include an unloading wharf, six 30,000-barrel storage tanks, two 5,000-barrel tanks and one 1,000-barrel tank, as well as piping to link the tanks, wharf, and main pipe line.

Two other joint bids were received, one for $31,812,739 and a second for $38,784,597.

An official military description of the route is set out as follows:

"For the first 50 miles from the Haines terminal, the general direction of the route follows the Haines cutoff road and the Klehini River through heavily timbered, steep mountainous terrain.

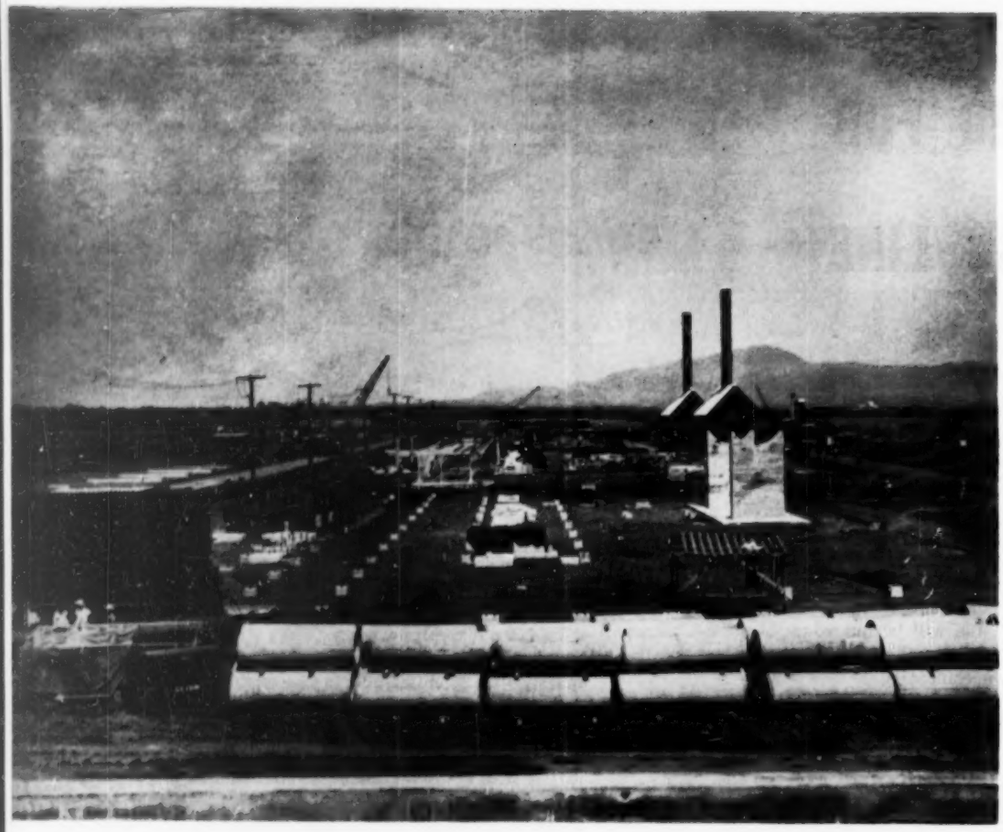
"The line then climbs to the summit of the mountains and from there descends gradually to the Alaska Highway near Haines Junction, through steep to gently rolling to fairly flat terrain.

"From Haines Junction to the northern terminus near Fairbanks, the line generally follows the Alaska Highway and the Richardson Highway through interior valleys and across rolling flat lands.

"Most of the route is timbered with small spruce, birch and alder, although there are many open areas covered only with brush and tundra.

"The soil is predominantly gravel over-

(Please turn to page 96)



Site of propane decarbonizing unit with crude still heaters in background.

FIRST REFINERY IN PHILIPPINES BEING ERECTED BY CALTEX

IN RECOGNITION of the rapid post-war growth of the general economy of the Philippine Republic, California Texas Oil Company interests are building a 13,000-barrel refinery on Luzon Island as part of the general Caltex expansion program in the Eastern Hemisphere. Other Caltex refineries east of Suez are operating, building or planned for erection on Bahrain Island in the Persian Gulf and in Lebanon, Australia, India and Japan. The company also has refinery interests in Spain, France, Italy and Holland.

Agreement to build the Luzon plant was reached with the Philippine Government on June 30, 1953 under terms of the Petroleum Act of 1949. Since the conclusion of negotiations, progress in site preparation has been rapid and it is planned to have the refinery in operation late in 1954. Owner and operator of the plant will be Caltex (Philippines) Inc., a Philippine corporation.

The Republic of the Philippines consists of three principal groups of islands of which the centers are Luzon, the Visayas and Mindanao. The group stretches 1,158 miles from north to south and 660 miles from east to west. Eleven of the islands have a land area in excess of 1,000 square miles each. Total land area of the Republic is about 115,600 square miles.

Population of the Philippines has been growing at a rapid rate since the close of the war, the annual increase being about two percent. In 1948 population was 19,134,000 and four years later in 1952 the total had reached 20,631,000. The Philippines still are sparsely populated when compared with such areas as Japan and Java. Mindanao, with a land area of 34,906 square miles, is especially lacking in population, but the Government is building a road system through the jungles to provide accessible land for new settlers from Luzon and Cebu.

Agricultural production was badly disrupted by the war, but now has recovered and is growing rapidly. In 1949 the Philippines produced 5,597,000 metric tons of agricultural products and by 1952 this had increased 40 percent to 7,781,000 tons. Sugar and cocoanut products are the principal farm exports.

Installing 42-inch sewer lines.

Temporary wharf for unloading plant equipment.

Roads and bridges were either destroyed or allowed to deteriorate during the war, but progress is being made by the Government in rebuilding. In this task the United States has aided. To build 605 kilometers of new roads on Mindanao, $5 million in new road building equipment is being imported.

At the close of the war, roads of all types totaled 24,200 kilometers and by June 30, 1952 this had grown to 29,800 kilometers, an increase of 23 percent. In 1951 an analysis of the 27,896 kilometers of roads then in use showed that 17.8 percent was dirt, 68.3 percent gravel and 13.9 percent intermediate and high-type.

Excluding motorcycles, motor vehicle registrations have increased 20 percent in the past four years as follows:

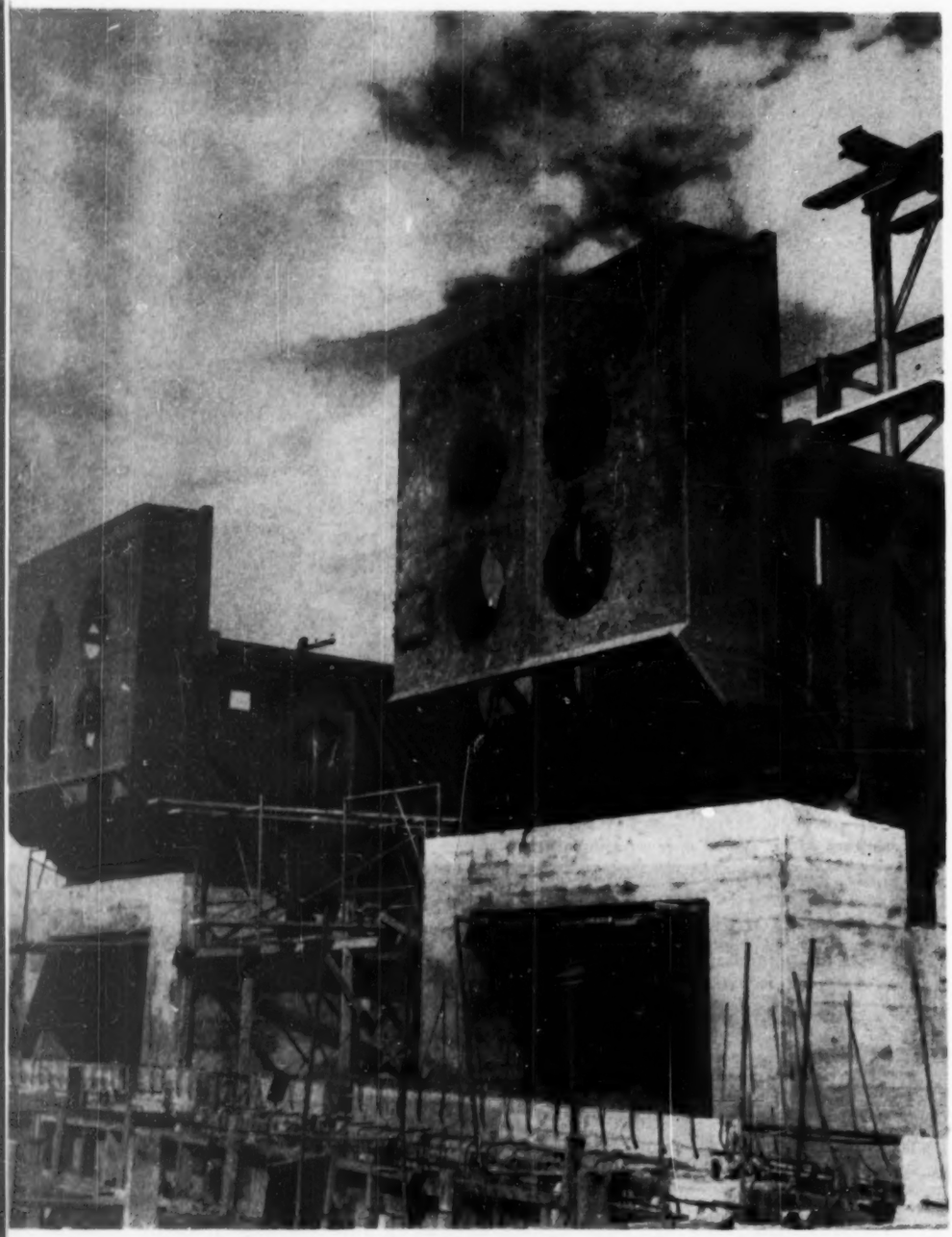
1948	88,355
1949	78,146
1950	92,925
1951	104,396
1952	106,194

A number of U. S. automotive firms are bidding for the growing Philippine market by establishing assembly plants in the Republic. Studebaker now is building cars and trucks and International Harvester Export Co. is assembling an average of seven trucks per day. Ford and Chrysler are preparing to assemble locally.

Other manufacturing activity is increasing. In the seven years since the end of the war, 24.1 percent of the capital invested in new companies organized in the Philippines has gone into manufacturing. Reynolds Metals Co. recently has planned an aluminum rolling mill, Rheem Mfg. Co. a steel barrel plant, and Borden Co. has built a resin and adhesive plant. A glass plant has been installed to supply domestic requirements. Medicinal and soap manufacturing plants have been built.

In the post war period, 745 new industrial enterprises have been established. Paid-up capital of these companies is $27 million (Pesos 54.1 million).

National income has increased 23 percent in the past four years. In 1948 the total was Pesos 5,713 million ($2,856 million) and in 1952 this had risen to Pesos 7,034 million ($3,517 million).



Work on the boiler plant is progressing rapidly.

Income has grown much faster than population. In 1948 per capita national income was Pesos 2,870 and in 1952 Pesos 3,770, an increase of 31 percent in three years.

Consumption of petroleum products in the Philippines has more than doubled since the war. The increase has been as follows in principal products.

YEAR	THOUSANDS OF BARRELS
1947	5,600
1948	7,500
1949	8,400
1950	9,712
1951	10,273
1952	10,560
1953 (Est.)	11,900

The rate of growth in per capita oil consumption, like that of national income, has been greater than the actual increase in volume. In 1948 the per capita consumption was 16.5 gallons in the Philippines and in 1952 this had risen to 21.5 gallons. A growth of another two gallons per capita is indicated in advance estimates for 1953

Breakdown of consumption by principal products in 1951 and 1952 was reported by the U. S. Bureau of Mines as follows:

	1952	1951
	THOUSANDS OF BARRELS	
Gasoline	4,150	4,077
Kerosine	1,195	1,210
Distillate Fuels	2,550	2,372
Residual Fuels	2,415	2,404
Lubricants	250	210
Total	10,560	10,273

The new Caltex refinery will be capable of supplying about 40 percent of the domestic oil requirements of the Philippines at the 1953 rate of consumption. When the plant is completed late next year, the proportion will, of course, be less if the current rate of increase in demand is maintained. Plant rating is 13,000 barrels per calendar day as against a domestic demand in 1953 estimated at 32,600 b/d.

Site on which the refinery is being built is a 259-acre tract on the shores of Batangas Bay, Luzon, about half way between the towns of Batangas and Bauan. The location is 72 miles from Manila, to which it is connected by good hard-surfaced roads. Manila is the largest city in the Re-

The "jeepney," a modification of World War II equipment left in the Philippines, is designed to carry eight passengers, but frequently carries more. There are some 10,000 of these in service in the Islands.

public and has a population of 1,300,000.

The plant will be on deep water so that incoming crude can be unloaded direct from ocean tankers and products can be loaded into vessels for delivery to other islands in the group.

Preparation of the site involved the removal of an entire fishing village with some 2,500 inhabitants. Fourteen fishing organizations have been relocated on the bay and 255 buildings moved or rebuilt.

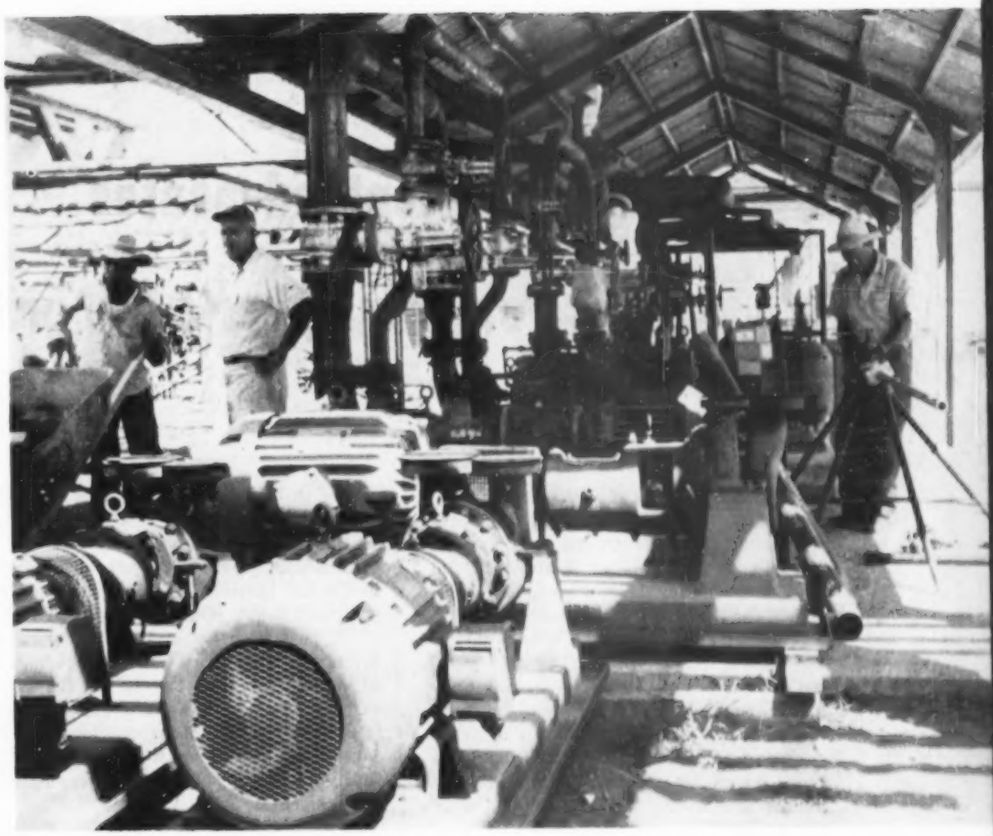
Principal products of the new plant will be motor gasoline, kerosine, diesel fuels, distillate fuels and residuals for both land use and ships bunkers. A flexible design was adopted to permit the processing of crude from various fields.

Major processing units will include a two-stage crude distillation unit, propane decarbonizer and fluid cat cracker and catalytic polymerization unit. Ancillary facilities will include a steam-electric power plant, wharf and the usual shops, warehouses, pump houses and cafeteria. A dispensary and small hospital will be built. Foster-Wheeler Corp. is prime contractor on the job and sub-contracts have been let to Philippine construction companies. W. G. Miller of the Caltex organization is project manager.

Accompanying photographs taken in October reveal the recent state of progress on the plant. All major foundations have been poured and most pumps and exchangers have been set. Process furnaces and fractionating towers for the crude unit are well advanced. Propane decarbonizing and cracking units have progressed only a little beyond the foundation stage.

A temporary wooden wharf is being used for incoming freight. This is to be supplanted later by a permanent concrete wharf with one berth for large tankers and additional berths for coastal barges.

Completion of the plant will be by progressive steps so that intermediate products will be available in ample quantity by the time the equipment for finishing operations is ready to go on stream. The catalytic cracking and poly units will be the last ones to be completed late next year.



Pumps and motors for product transfer in place.

Refinery cafeteria under construction.

The "Caltex Estrella," inter-island oil tanker operating in Philippine waters.

Preparing forms for precasting segments of the permanent concrete wharf.

Defense Department advocates oil imports for hemispheric security

By Joseph Huttlinger

THE DEPARTMENT OF DEFENSE is preparing to oppose the cutting off of oil imports to the United States on the ground that they help achieve self-sufficiency for the entire Western Hemisphere. The department remained silent during the heated controversy earlier this year, but now is prepared to go before Congress to oppose bills that would limit oil imports to 10 percent of domestic demand.

The department tipped its hand on these views in a letter to the Senate finance committee recently which made these points:

(1) A basic aim is to gain oil self-sufficiency for the Western Hemisphere.

(2) Oil from Canada is of major importance to United States security; then comes oil from Venezuela and from other countries in this hemisphere.

(3) The United States must import oil from these areas now, to be sure of having it in time of war when it would be essential.

(4) United States oil producers are not suffering from imports to such an extent that they are curbing exploration and drilling.

By its silence, the department may have implied that it regards Middle East and Far East oil as less important from a security angle than oil from the Western Hemisphere.

Navy Captain S. B. D. Wood of the adjutant general's office signed the letter "on behalf of the Department of Defense."

A closing of the United States market to foreign oil, the department believes, would slow down oil operations in Canada and Venezuela. But this "would be inconsistent with the concept of providing and maintaining Western Hemispheric self-sufficiency," the department believes.

"The Department of Defense favors a reasonable balance between imports and exports for the Western Hemisphere as a whole so as to avoid any unnecessary drain on Western Hemisphere resources or dependency in the event of war on non-Western Hemispheric supplies."

In time of war, it says, the United States would have to look to other areas, chiefly in this part of the world, to meet military needs of itself and allies and essential civilian demands.

Canadian oil should figure importantly in future hemispheric security, the department holds. On this subject it says:

"It is also believed that the possible deterrent to future Canadian production of petroleum could be one of the most serious effects of the bill (to limit oil imports). Canadian production can be considered as our most important safe, future source of petroleum for emergency requirements.

"The statement has been made that Canada represents the most important oil reserves in the world. Even if that be an exaggeration, it is an indication of the volume of crude oil believed to be present in Western Canada.

"Exploration and development are now proceeding rapidly with, as an incentive, the worsening shortage of California crude which Canadian crude can logistically alleviate. If the incentive is removed, development can be expected to be slower, even though it should not stop completely.

"It is definitely in the best interest of national security to have Canadian development proceed as rapidly as possible."

Looking to Venezuela, the department pointed out that this is the source of the greater part of United States imports of crude oil and products and comments: "It is, therefore, clear that Western Hemisphere oil is essential to our security in the event of war."

To have oil in time of war means to have an active industry all along, the letter said, explaining: "Any attempt to restrict such imports into the United States on an established quota basis would likely undermine the vitality of our present Western Hemisphere sources and would deter further development of petroleum reserves in those areas.

"For example, the foreign country which would immediately and most substantially suffer from the proposed import limitation on petroleum and petroleum products would be Venezuela. Production cutbacks in Venezuela would be substantial and would have a harmful effect upon United States economy and security interests."

Admitting that if imports to the United States are too large they can hurt the domestic industry by discouraging exploration, and that this is contrary to the national interest, the letter says that, "Based upon the petroleum industry to date, however, it is felt that no such condition exists at this time."

Acknowledging that the political and economic factors are for others to review, the department sums up its conclusions by saying, "It is considered, however, that the imposition of limitations on oil imports will tend to weaken the national security."

The significance of the letter is that it gives a government view on the conflicting claims as to just where the nation's security interest lies. For some time one group of United States producers has claimed that the best security is to have a mighty United States oil producing industry, and that this comes from high activity and high production. Imports, it is claimed, hinder this by placing a ceiling on production and incomes and thus upon exploration incentives.

Oil importing companies, on the other hand, claim that the security of the United States in oil lies in oil imports to some extent—the level never clearly set out—which guarantees that there are foreign oil wells, able to produce, and tankers in service to carry the oil to the United States.

Perhaps it is significant that President Eisenhower not long ago took the position that the United States needs oil imports from countries in the Western Hemisphere, but was silent about the situation in the Middle East. As it stands, the defense department letter is one more expression along this line.

With the letter on the public record, the big questions ahead, apparently, are just how hard the department will press its views, and whether it will support specific legislative measures that way if proposed. Its position is clear, however, in urging that the subject be viewed from the angle of hemispheric security.

Depletion allowance and tomorrow's oil

By B. Brewster Jennings*

EVERY DAY, Sundays and holidays included, the people of the United States are using a million tons of oil—more than two gallons for every man, woman and child. That is twice as much as we were using just before the second World War, and about half what some authorities estimate we'll be using by 1975. We now rely on oil and closely associated natural gas for roughly three-fifths of the mechanical and heat energy of the country, and that reliance too is increasing steadily and rapidly. In peace, prosperity, and in war, security, depend more and more on abundant, inexpensive petroleum energy. What have we done, and what should we do, to insure that we'll never run out?

The answer lies in the all-important subject of conservation which, in its broadest sense, goes to the heart of some of the biggest issues confronting us, and is a good deal more complicated than might appear at first glance.

It wasn't long after Drake brought in the world's first oil well that people began to wonder how long it would continue to produce. Later, and when oil operators had begun to form fair-sized companies, there were plenty of pessimists who predicted the early exhaustion of the Pennsylvania field, and the bankruptcy of the new industry. Though these early views have happily been proved wrong, the responsible people in oil knew that great as is the supply of oil in the ground, it is nevertheless limited. During the past several decades, therefore, the industry has devoted much effort and money to devise better methods of finding, producing and refining oil. This effort to get the greatest possible use from each barrel originally in place in its reservoir is conservation in the best sense of the word.

Great progress has been made in reducing loss of product in handling, improving above-ground storage facilities, and minimizing the flaring of petroleum gas. Far more important, though, in terms of quantity of oil involved, have been the gains in getting out of an oil field a larger proportion of the oil that is in it. Thirty or 40 years ago oil men were lucky to recover 20 or 25 percent of the oil in a reservoir. Now, primary recovery from our new oil fields is very often at least 50 percent and sometimes as high as 85 percent of the estimated underground reserves. Today we are cleaning out our oil fields by gas pressure, water pressure and even fire. And the difference between today's recovery figures and those which would be obtainable by the methods of 25 years ago is measured in billions of barrels of oil.

Other roads to oil conservation have been improved exploratory methods and better drilling techniques that have enabled oil men to discover and tap oil reserves far below what used to be regarded as the economic limit for drilling. Twenty years ago less than a mile was as deep as it paid to go. Today we are producing a good deal of oil from depths of two and a half miles, and have actually drilled down four miles. And but for advances in the techniques of drilling underwater wells, including directional drilling, the whole hotly debated and widely misunderstood subject of offshore oil would still be academic.

Improvements in oil refining methods, enabling us to get twice as much gasoline from a barrel of crude as was possible 30 years ago, have been the equivalent of finding billions of barrels of oil. Improvements in our products, which have gone hand in hand with improvements in the machinery in which they are used, likewise have meant as much to our useful supply of petroleum energy as the discovery of several East Texas oil fields. Outstanding among such product improvements have been longer life for our lubricants and higher octane numbers for our gasoline. It has been demonstrated that two gallons of today's gasoline in today's engines will do the work, by any test, that three gallons would have done a quarter of a century ago.

Aside from the benefits of conservation in making our known supplies of oil go further, an important question is that of the steps necessary to assure adequate oil for future needs and possible emergencies.

One suggestion is to stockpile an emergency supply of oil. The total effective storage capacity in the United States for crude oil and refined products is less than we use in 90 days. To build enough to hold even a single year's requirements would be fantastically expensive, and to store any such amount would involve prohibitive losses on account of evaporation, to say nothing of the added transportation cost of the movement into and out of storage and the billions of dollars that would be tied up in such an oil inventory.

Another idea that hasn't worked is to set aside proved and at least partially developed reserves. Our government has tried that approach, but in two world wars these Naval petroleum reserves contributed virtually nothing to the huge supply of oil required. Nations that have failed to discover and develop their oil have invariably had to depend on someone else's dynamic oil industry when the chips were down.

As against the futility of those ideas, the effectiveness of a dynamic and growing oil industry in meeting this problem of national security is self-evident. The oil industry in the United States since its beginning has been that kind of industry. Not only at home, but also abroad, Americans, sometimes as individuals, at other times banded together in companies large and small, have pushed forward in all phases of oil operations. The results of this effort attest its soundness. Right now, proved oil reserves in the United States exceed the total of all the oil used in this country from the day Drake's well was brought in to the end of the second World War. And that despite the fact that we have used more oil from our domestic reserves since 1941 than we knew we had at that time.

It would be hard to think of a better demonstration of the applicability to present-day affairs of the wisdom in the Biblical story of the talents than is provided by the American oil industry.

Because it is so very important to the maintenance of abundant supplies of oil

*Condensed from an address before Oil Progress Week luncheon, October 13, 1953.

that the industry retain its dynamic character, I would like to call attention to some of the prerequisites to that condition. The first is that the keen competition which now characterizes the American oil industry continue. It is competition that has made us what we are. Only when those in an industry must vie with each other for the trade of the consumer, and hence for their own survival, will the industry be progressive. In the absence of competition, stagnation inevitably will take the place of progress.

A second requirement for a dynamic oil industry is that those engaged in it be financially solvent. By its very nature, searching for oil is extraordinarily hazardous. One wildcat well in nine finds oil. And of those wells that do find oil, only one in 44 finds as much as a million barrels.

In addition to the hazards of the producing side of the business, oil men face all the customary risks of obsolescence in the other branches of the industry—the danger, for instance, that the tens of millions of dollars put into a new refinery today may have lost much of its value even before the new unit goes on stream, due to improvements in methods and designs coming out of our laboratories or those of our competitors. To have the willingness and the ability to assume such risks our industry must be financially strong.

Then, too, insuring an abundant supply of oil at all times requires long-range planning. Research for the gasoline that goes into today's automobile may have begun ten years ago. The quest for the crude oil that will be refined into the motor fuel of 1963 is already under way. Those searches must go on unabated, despite temporary periods of over-supply unavoidable in a business wherein no one knows whether the next wildcat well will bring in a hundred million barrels of oil or be a duster.

Financial solvency requires, among other things, that the industry's products be sold for fair prices. Because the oil industry has been dynamic and progressive all these years, it has, through improved techniques, been extraordinarily successful in being able to sell its products cheaply. Study of any period that may be selected will show that oil has been getting less expensive relative to other things. Yet it has not been possible completely to overcome the effects of inflation and the resulting higher dollar costs of labor and material. Fair treatment as to taxation is another prerequisite of a sound domestic oil industry. Obviously oil must always pay its share of the national tax bill. Loyal Americans would not want it otherwise. Oil, though, happens to be an industry based on the extraction of a mineral, and so, just as in other so-called extractive industries, it is neither practicable nor fair to figure taxes the same way as they are figured for non-extractive industries. Somehow, account must be taken of the fact that production of oil depletes an irreplaceable natural resource. Ever since 1918 Congress has provided for this through the depletion allowance. This depletion allowance is such a vital provision and is so little understood, not only by the average citizen, but by many oil people too, that I would like to say a few words about it.

Let me emphasize that I do not regard the percentage depletion allowance as being in any sense a subsidy. Those who call it that miss the point. You don't subsidize a man by not discriminating against him, and neither do you subsidize an industry that way. It is undoubtedly true that reduction or elimination of the percentage depletion allowance would mean that consumers would have to pay higher prices for oil products, but that would be so if the oil industry were penalized unfairly by any other method. Justice is not a subsidy, however beneficial it may be to the recipient. The depletion allowance is a recognition of discovery value, and the principle on which it is based is just as sound as the principle of not taxing capital gains as ordinary income and just as equitable as a depreciation allowance on a factory and its equipment.

There are some who, though they accept depletion in principle, question the propriety of having it on a percentage basis. The answer is quite simple. The early depletion statute required that a value be determined for every lease, and then that value be recovered at so much per barrel over the estimated life of the property. This proved quite unworkable because of the great number of individual leases which had to be appraised. There weren't enough engineers to do the job, nor could there ever be enough government employees to pass on the values set by the engineers. Congress solved this administrative problem in 1926 by adopting percentage depletion. It was brought out during the Senate debate that a study by Treasury Department experts of a number of producers' tax returns showed that the depletion allowance, with each lease evaluated separately under the 1918 law, averaged about 37 percent of gross income over a three-year period. The Senate rejected by a single vote a proposal to make the percentage 35, then passed a bill setting the figure at 30 percent. In a Senate-House Conference Committee, a compromise figure of 27½ percent was agreed on and has been in effect ever since.

Some still question this 27½ percent figure. Is it too high or too low? It is probably impossible to calculate a precise answer. Oil prices have gone down and up since 1926, and so have costs. By and large there has been no appreciable change in the overall relationship between the value of oil in a proven developed lease, the posted price for oil at the wells, and the costs of operating the lease. The 27½ percent was a modest figure in 1926, and I think it still is.

A fairly accurate check on this rate is that the values placed on proved oil-producing properties, as traded out between buyer and seller in the market place, are usually so high that the buyer elects to use cost rather than percentage in depleting the property. This indicates that the "discovery value" postulated by the present depletion statute is less than the going market value, and suggests that the 27½ percent figure is, if anything, on the low side.

Critics of the depletion allowance ignore two very fundamental differences between the oil business and other businesses. The first is that the value of a discovered oil field bears no relation whatsoever to the cost of the lease and the successful well. This is not so in an ordinary business, where the owner knows in advance what he will have if he builds a $1,000,000 factory or a hotel, or what have you. The second important peculiarity of oil, though it applies also to the mining industry, is that for every success, several failures must be expected. On the average, only about one wildcat in nine finds oil, and only one in 44 is a commercial success. What would an automobile manufacturer be up against if he had to build nine factories in order to produce cars out of one?

In addition to maintaining a strong and dynamic domestic oil industry, there is another perhaps equally important thing that must be done if we are to be sure of always having adequate oil supplies in time of need. We must maintain access to developed oil reserves outside of the United States. Without specifying oil, President Eisenhower recognized the principle when he said recently that "materials from abroad are as vital to our economy as foreign markets to receive our goods." America uses over 60 percent of the free world's oil production, but has only about 25 percent of the free world's proved oil reserves. America's oil prospects have been tested by one and a half million wells, compared with 2,000 wells drilled in the Middle East, where known reserves already are nearly twice as large.

Unless additional oil imports are available in the years to come, we will find it difficult, if not impossible, to meet expected demand for oil and maintain the present ratio of proved reserves to production in the United States. To maintain this ratio over the next 20 years without additional imports the oil industry would have to find a billion barrels more oil a year than have been discovered annually in this country since World War II. In this connection it must be borne in mind that since 1946 we have had a greater program of exploration and development than ever before. Yet, despite this long-range prospect in the domestic

(Please turn to page 80)

W. G. Walkley, managing director of Ampol Petroleum Pty., shows Americans at Exmouth Gulf the bronze plaque commemorating the Allied landing in 1942. Left to right: E. C. Ingreham, U. S. Vice-Consul for Western Australia; M. G. Smith, general superintendent of West Australian Petroleum Pty.; Mr. Walkley; and Al Dysart, chief driller, Brown Drilling Co.

Chas. Henright, rig engineer for Brown Drilling Co., is shown holding a pet baby kangaroo.

American drillers renew wartime links with Australia

By George Farwell

TWICE WITHIN 10 YEARS Australians and Americans have joined forces in a common venture on one of the most lonely shores of the southern continent. On the first occasion the purpose was to defend Australia's vulnerable tropic coastline in war; the second is to develop its peacetime resources.

Today a group of American oil men head a search for oil at Exmouth Gulf, 750 miles north of Perth, Western Australia, where in 1942 the United States Navy set up a top-secret submarine base.

Exmouth Gulf, regarded as Australia's most promising region for the discovery of oil, is also one of its most barren and uninhabited areas. The vast, almost treeless hinterland has only a few sheep stations (ranches), averaging some 200,000 acres each. The spare grass and desert-type spinifex can support no more than one sheep to 15 acres.

Drilling for oil is now under way, the first well having been spudded in during September. The drilling site is 15 miles from the southwestern shore of the gulf. The operating company, West Australian Petroleum Pty. Ltd., is jointly owned by Ampol Petroleum Pty., an Australian company, and California Texas Oil Company, which holds 80 percent of the shares.

At the head of the massive 142-foot derrick, the Southern Cross and Stars and Stripes fly side by side in the trade winds blowing across from the Indian Ocean.

Beside the landing jetty, near Learmonth aerodrome, stands a stone cairn commemorating that earlier venture between men of the two nations. On a bronze plaque is this inscription:

"Rear Admiral Charles A. Lockwood, Jr. USN, Brigadier B. E. Klein AIF, Commander Joseph L. Thew USN, Lt. Col. J. S. Young AMF, landed here September 11, 1942 to carry out initial reconnaissance for the 'Potshot' venture."

"Operation Potshot" was an undertaking of great urgency at that time. The Japanese had captured Timor and appeared to be making ready for an invasion of Western Australia. A task force was immediately rushed to Exmouth Gulf, whose smooth and shallow waters were ideal for sheltering submarines.

The operation gained its name when Rear Admiral Lockwood, drinking a toast to it in the U.S. Navy's Perth headquarters, said to his fellow officers, "Well, we'll take a potshot at it."

While the U.S. Navy established its base, Australian troops were busy erecting anti-aircraft guns and a radar station. Soon after, the Royal Australian Air Force began to build an aerodrome big enough to suit heavy bombers, but no invasion came.

Today, Learmonth aerodrome is used by mailplanes on their 2,000 mile route between Perth and Darwin, Northern Territory.

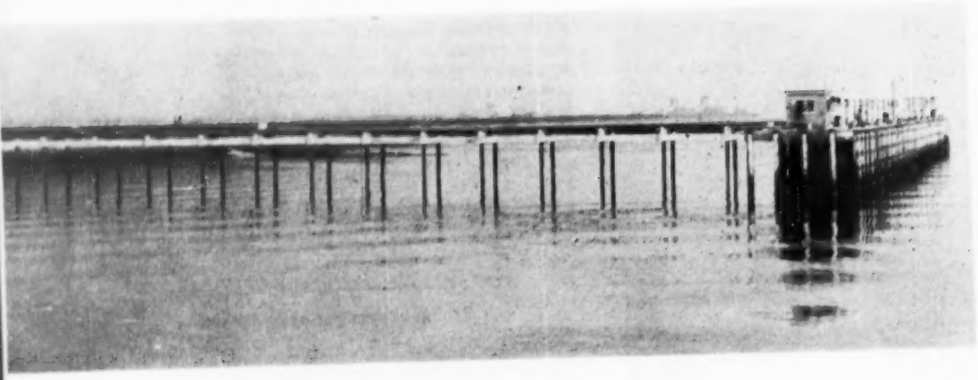
American oilmen, Australian field workers, stores, fresh foods and medical supplies are flown in for the drilling camp back in the Rough Range behind.

Only the airstrip brings the movement of life to Exmouth Gulf, for no sign remains of the U.S. Navy base which once held 1,000 men. Australians called it "Yankeetown" in those days, but the swift growth of the tropics has obliterated it.

In 1945, the cairn recalling the wartime comradeship was washed away by a tidal wave. Nothing appears to last long in a region of fierce tropical heat and recurrent cyclones.

With the arrival of American and Australian oilmen early in 1952 has come the re-erection of the cairn, close to the place where servicemen made their initial landing and where, 10 years later, thousands of tons of oil-drilling gear now have been lightered ashore from a United States freighter.

Photographs by Scott Polkinghorne



Coastal tanker and barge filling jetty at Regent Oil Company's Canvey Island installation.

REGENT OIL COMPANY BUILDS CANVEY ISLAND TERMINAL

THE NEW ONE MILLION pounds bonded ocean terminal and storage installation of the Regent Oil Co. at Canvey Island on the Thames is nearing completion.

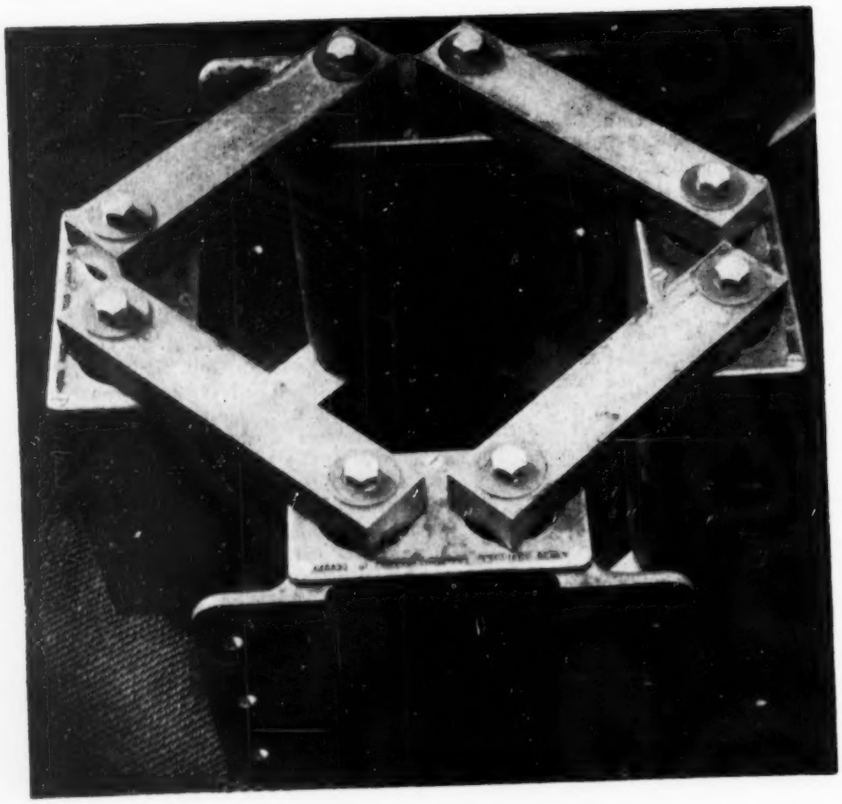
The Regent Oil Co. is the selling and distribution organization in the United Kingdom of Trinidad Leaseholds Ltd., the Caltex group including the Bahrain Oil Co., and handles Regent motor spirits, Havoline lubricants and all grades of illuminants and fuels.

The new terminal will take in and distribute in bulk all the lighter products up to gas and diesel oil which are imported into England by the companies. Distribution to depots in the U.K. will be by coastal tanker, barge and tank trucks, the major portion being distributed by coastal tanker and barge.

For the handling of shipping, two new jetties have been built out into the Thames, the depth of water available at each of these jetties at low tide being about 40 feet. At the barge jetty, provision has been made for the loading of eight barges simultaneously, or for loading four barges and a coastal tanker at the same time. The tanker discharge jetty has an 800-foot approach from the shore with a T-head approximately 282 feet in length, and is able to berth tankers up to 28,000 dwt capacity at all states of the tide. Designer of the jetties is J. H. R. Haswell, and the builder is J. L. Kier & Co. Ltd.

Fendering for the coaster and barge berths consists of steel box piles whose heads are connected to the deck of the structure by means of fender units which are arranged to allow the heads of the piles to deflect in any direction against an ever-increasing resistance. The whole arrangement has been designed to accommodate vessels up to 2,000 tons displacement. Each of the fender units consists of a link mechanism in which Neidhardt rubber shock absorption units have been substituted for the bearings. The units are constructed of aluminum alloys. The units are safeguarded against an exceptionally heavy accidental blow by means of a timber stop which would have to be crushed by the power before the fender unit had reached its maximum travel.

The fender system for the tanker berth consists of reinforced concrete gravity fenders which have been designed to ac-



Closeup of the link mechanism of the fender units on the barge jetty.

commodate tankers of 28,000 tons displacement. Each of the reinforced concrete fender blocks, weighing some 27 tons, is suspended on hinged rigid steel panels. The horizontal travel is 2 feet 8 inches and the vertical lift of 1 foot 3 inches gives an energy absorption of approximately 400 tons. A new development is the inclusion of a vertical roller to eliminate the consequences of an accidental glancing blow from a vessel during berthing. A heavy roller consisting of a steel box core clad with greenhart timber is housed between the vertical timber rubbing strips of each fender.

Storage capacity of the installation is about 56,000 tons of light oils and is made up of 24 tanks 30 feet high with diameters ranging from 33 to 92 feet and capacities from 500 to 4,000 tons. Height of the tanks is restricted to 30 feet on account of the nature of the ground on which the installation is built. All the tanks are roofed to stand a water pressure of 8 inches and a vacuum of 2.5 inches, and all are fitted with clean-out sumps at the bottom. They are all welded tanks built to API specification 12C.

Each tank is fitted with water sprinklers and fittings for top foam injection and venting and dipping is by Shand and Jurs patented apparatus. Oxley Engineering Co. were the builders of the tanks and the venting and dipping apparatus was supplied by Whessoe Ltd. under license.

During the building of the tanks, all welding was inspected by "gamma radiography" by Welding Supervision Ltd., to an extent corresponding to the API scale of probe testing. The vertical seams on the bottom courses of the tanks have been 100 percent inspected by gamma rays and application of root runs on vertical seam welds has been supervised. The welding of the pipe work in the installation has been similarly inspected.

The jetty pumphouse for the loading of barges and coastal tankers is fitted with six pumps and one stripper pump. The main pumps are Worthington Simpson centrifugals driven by English Electric Co.'s flameproof motors. There are four pumps of 500 gpm capacity and two 1,000 gpm pumps. The stripper pump is by Stothert & Pitt with a capacity of 230 gpm and is manifolded in such a way that any line after use can be cleared and its contents pumped back to storage.

Manifolding of the main pumps is such that any tank and pump can be directly connected to any jetty terminal. All suction lines are fitted with filters to ensure clean discharge to barges or tankers.

The depot pumphouse is fitted with seven 200 gpm and two 100 gpm centrifugal pumps driven by flameproof motors of the same make as the main pumps. The duty of this pumphouse is the loading of road tankers, blending of products and transfer into tank farm. There is also an Ethyl blending plant which has been built to Associated Ethyl Corp. standard specifications with changing and washing equipment.

The fire service station is fitted with two 500 gpm 356-foot head Sigmund pumps electrically driven by Laurence Scott motors, and two similar pumps driven by Meadows diesel engines, so that there is ample fire service should an electrical breakdown occur.

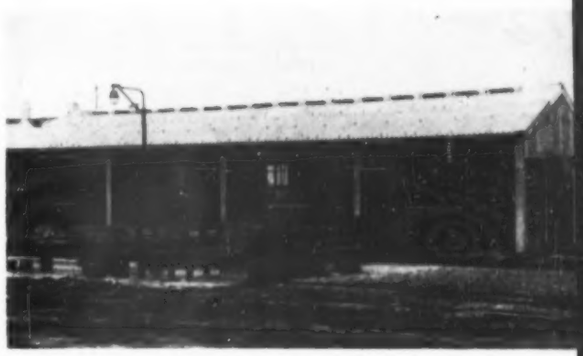
These pumps discharge into a ring main fitted with hydrants and normally take suction from the river. There is also a pond, which is kept filled from the river at high tide through a line fitted with non-return valves. From this pond a channel runs which is fitted with 36-inch drain pipe wells into which mobile pump suctions can be lowered.

The administration building contains offices, laboratory, mess room for the staff and ample toilet facilities. Close to the jetties is the operational staff mess room and barge accommodation, the latter being fitted with sleeping accommodation for crews of barges which may be held up overnight. The operational staff messing room is fitted with facilities for heating food and boiling water, the number of operating staff required not justifying the provision of a canteen. There is also a garage for road tankers.

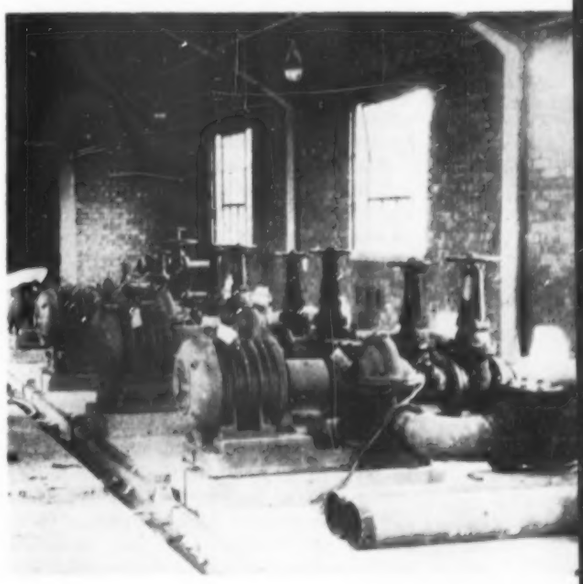
Electrical power for the installation is drawn from the grid at 3,330 volts and stepped down at the transformer house to 440 volts for motors.

All pipe work on the installation has been carried out by Wm. Press & Co. Ltd., electrical work by Thorpe & Thorpe and all civil engineering and building by John Howard. Consulting engineer for the installation is B. J. Ellis.

Rear view of administration and testing laboratory building.

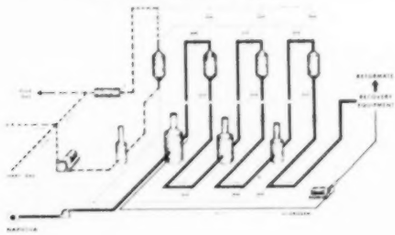


Main pumphouse manifold.



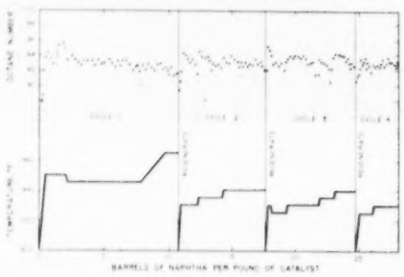
Part of main pumphouse during construction.

FLOW DIAGRAM OF THE ULTRAFORMING PROCESS



Cyclic regeneration is feature of new reforming process

OPERATING PATTERN OF ULTRAFORMING



ULTRAFORMING, a new catalytic reforming process employing a platinum-bearing catalyst, has been developed to the commercial stage by Standard Oil Co. (Ind.). The process is being offered to other refiners under license, it was announced by J. K. Roberts, Standard's director of research and development. Recognized engineering and construction companies will be authorized to install plants for licensees.

Ultraforming is the sixth platinum reforming process now available to the industry. Commercial installations of all six are now building or in operation. In the case of Standard of Indiana's new process, three units with an aggregate capacity of 36,800 barrels daily are under construction or contract.

First to go on stream will be a 6,800 b/d unit being built by The Lummus Co. for Pan American Southern Corp. at El Dorado, Arkansas. It is expected to be completed in May 1954. Pan Am also is building a unit at Texas City, Texas. This is to be a 21,000 b/d unit erected by the M. W. Kellogg Co. Standard itself is having Kellogg build a 9,000 b/d unit at Wood River, Ill.

Standard of Indiana is one of the developers of the Hydroforming process which was employed during World War II to produce large quantities of aromatic stocks for the recovery of toluene. The company operates a fixed bed unit of this process at Whiting, Ind., has recently built a unit of the modern fluid version of the process at the Pan Am refinery at Destrehan, La., and is building a very large fluid Hydroformer at Whiting to supplement the present fixed bed. The Hydroformers, employing a molybdenum-type catalyst, give lower yields on most virgin stocks. However, they are not nearly so sensitive to the type of charging stock processed. Stocks containing heavy ends, high sulfur content, or large proportions of cracked stocks are advantageously processed. Ultraforming, although not as sensitive as fixed-bed continuous platinum catalyst units, is designed especially for the reforming of straight run naphthas.

Ultraforming is a fixed bed process in which the catalyst is regenerated by a new technique that keeps catalyst performance at its peak. To attain continuity of operations, a fourth reactor is installed in a typical three-step unit which is so manifolded that it may replace any one of the other three while regeneration of that reactor is in progress.

Standard is silent about its new regeneration technique which appears to be the heart of the process. Details are being withheld while maximum patent protection is being arranged. The accompanying flow diagram shows only that an inert gas, air and flue gases are mixed, passed through a heater and thence to the catalyst bed. It is claimed that the extra cost for platinum in the swing-case and other parts of the regenerating equipment is more than offset by the advantages of cyclic regeneration.

With cyclic regeneration of catalyst the Ultraforming process is conducted at lower operating pressures. Pressures may be in the vicinity of 200 psi compared with 500 to 700 psi in the case of a non-regenerative process. At such low pressures the hydrocracking reaction is minimized and the yield of gasoline increased.

Standard researchers found that low pressure processing of a low-boiling mid-continent naphtha operating to produce 85 Research octane product attained an increase of two percent in yield of 10-lb. gasoline. When the process was operated to produce 95-octane gasoline, the increase in yield was about 10 percent.

By maintaining a high level of catalyst activity and selectivity through frequent regeneration, the effective ceiling on octane number of product is kept near that attained by new catalyst. An accompanying chart indicates how the octane level is maintained between regenerations by progressive increase in operating tem-

ULTRAFORMING DATA

FEED	Gulf Coast		Mid-Continent		Mid-Continent		Arkansas	
ASTM DISTILLATION, °F.								
Initial	274		206		119		113	
10%	284		237		174		159	
50%	315		274		257		237	
90%	363		324		332		325	
End Point	392		361		378		375	
COMPOSITION, vol. %								
Paraffins	21.5		50.0		55.0		77.0	
Naphthenes	57.0		41.5		38.0		15.0	
Aromatics	21.5		8.5		7.0		8.0	
RESEARCH OCTANE NUMBER	57.0		44.5		49.4		47.8	
OCTANE LEVEL	90	100	85	95	85	95	85	90
YIELDS								
10-lb gasoline, vol. %	109.3	96.2	103.0	92.0	98.5	87.5	93.0	84.7
C_5+ vol. %	91.0	84.0	89.9	82.8	88.7	78.3	82.8	77.5
Butanes, vol. %	3.3	6.4	3.1	5.5	4.1	8.0	8.9	11.6
Dry Gas, wt. %	4.4	8.6	4.8	8.4	5.1	10.0	7.0	9.1
Hydrogen, cu. ft. per bbl.	875	1050	970	1150	870	1060	530	600

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Our planes and pleasure cars . . . our farms and factories . . . our prosperity and our national progress owe their continued development to oil. Helping in the search for new oil resources are the Schlumberger research scientists who are continually exploring possible new applications of modern science to problems of the oil industry.

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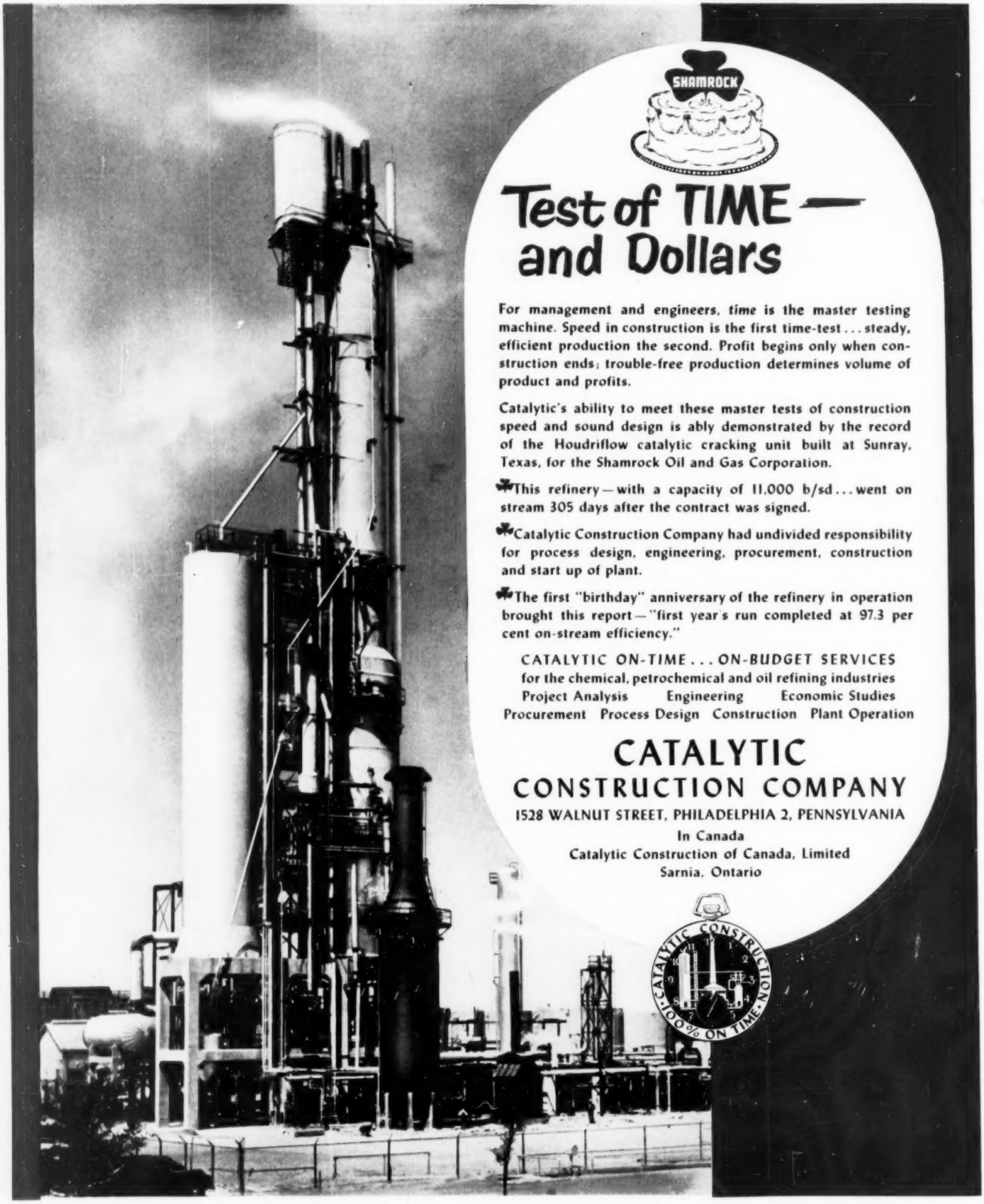

Test of TIME — and Dollars

For management and engineers, *time* is the master testing machine. Speed in construction is the first time-test . . . steady, efficient production the second. Profit begins only when construction ends; trouble-free production determines volume of product and profits.

Catalytic's ability to meet these master tests of construction speed and sound design is ably demonstrated by the record of the Houdriflow catalytic cracking unit built at Sunray, Texas, for the Shamrock Oil and Gas Corporation.

- This refinery—with a capacity of 11,000 b/sd . . . went on stream 305 days after the contract was signed.
- Catalytic Construction Company had undivided responsibility for process design, engineering, procurement, construction and start up of plant.
- The first "birthday" anniversary of the refinery in operation brought this report—"first year's run completed at 97.3 per cent on-stream efficiency."

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peratures. The researchers found that lower temperatures could be employed after regeneration than with new catalyst in the reactor.

At Standard's Whiting research laboratories the process has been conducted in 17 research-scale units. Two of the largest units charged from 10 to 20 pounds of naphtha per hour.

Although the research has been in progress for some time, Standard has not yet come to a conclusion as to the ultimate life of its particular catalyst. In favorable operations, 90 barrels of reformate per pound of catalyst is expected, 30 to 60 barrels is certain and there are some who think that the life may be indefinite under favorable conditions. Catalyst costs ranging from four to 13 cents per barrel of reformate are mentioned.

In an effort to shed light on catalyst life expectancy, what may be termed accelerated aging runs are being conducted. In these runs difficult naphtha stocks have been selected, stocks high in sulfur and contaminated with heavy ends.

American Cyanamid Co. co-operated with Standard of Indiana in catalyst development and will manufacture the product and rework spent catalyst. Replacement cost will be about $4 per pound, including charges for recovering platinum. The platinum is said to be supported on alumina, composition being about 99 percent alumina.

Yields from typical Gulf Coast, Arkansas and Mid-Continent naphthas are shown in an accompanying tabulation. With certain Gulf Coast naphthas with high naphthene content, an octane level of 100 can be obtained with a yield of 96.2 volume percent of 10-lb. gasoline. Mid-continent stocks will yield 87.5 to 92 percent of 95-octane, 10-lb. gasoline and an unfavorable Arkansas naphtha with a naphthene content of only 15 percent will yield 84.7 percent of 90-octane gasoline.

Ultraforming may be conducted with or without scrubbing equipment for sulfur removal from recycle hydrogen. Standard researchers believe that sulfur poisoning of catalyst may not be important in commercial operations because of the removal at frequent intervals during catalyst regeneration. Sulfur removal for other reasons may be undertaken by certain plants.

New Peruvian decree promotes exploration

By Dr. J. E. Rassmuss

LIMA, PERU

BY DECREE of October 16, 1953, the Peruvian Government authorized the free import of any drilling equipment or geophysical outfit, to be employed by drilling contractors or geophysical companies for oil exploration in the country. Such contracting companies must register at the Direccion de Petroleo and may introduce free of import duties and additional taxes oil industry equipment for a period of two years, which may be extended for two years more. If the material is not re-exported after this period it becomes liable for payment of duties.

This new decree is intended to promote exploration and speed up development of the newly granted concessions, in order to enable the oil companies to reduce their investments at the beginning by contracting geophysical and drilling enterprises. It should favor also the newly consiituted national companies and in the same way the smaller foreign companies by exempting them from the import of expensive equipment and the corresponding duties.

A considerable number of geophysical and drilling contractors are active at present in Peru. Several large companies, including Standard Oil N. J. (International Petroleum Co.); Standard Oil of California (Richmond); and Cities Service Co. (Peruvian Pacific Petroleum Co.), have contracted with drilling companies for their first wells.

Among geophysical companies operating in Peru, Robert Ray Inc. of Houston has carried out or is now engaged in magnetic, gravimetric and seismic surveys for Conorada Corporation, Richmond Petroleum Co., Petrolera Peruana and Sea Oil Ltd. United Geophysical Co. of Pasadena is employed by Sullana Co. Hoard Exploration Co. of Houston has done work for Empresa Petrolera Fiscal and has other contracts. E. F. Peters Formation Logging Service has supervision of the first Richmond well.

Among drilling contractors, Santa Fe Drilling Co. is putting down the first Viru well of International. It has signed a contract also with Peruvian Pacific Petroleum for its first wells in the north in the new operating area agreed upon with Empresa Petrolera Fiscal. Santa Fe also is in charge of the development of EPF. Loffland Brothers Co. of Tulsa spudded in early in November the first well of Richmond Petroleum Co. in southern Sechura. Dunlap & Graham Inc. of Long Beach, which conducts exploratory drilling for EPF, is reported also as contracting offshore wells. Other drilling companies, including Drillexco and Camay Drilling Company of Los Angeles, have sent representatives to Peru to study conditions.

The new decree of the Peruvian government marks a further step in promoting fast development of the oil resources of the country and encouraging competition by facilitating the entrance of new contractors.

The oil companies themselves have shown their desire to push forward the work of exploration. Max E. Crawford, operations manager of International Petroleum Co. in Talara, estimated in an informal speech in Lima that exploration costs of his company in Sechura, to be spent over a six year period, would amount to $23 million, of which $7.9 million would go to geological and geophysical research, $9 million to drilling costs, $4.4 million to drilling, transport and construction equipment, including investments in construction of water pipes, communication lines and camps, and $1.7 million for rentals, taxes and purchases, not including cost of production if commercial oil is found during this period.

Investments of the oil companies in the new concessions are estimated at around $15 million, including six million for taxes and deposits with the government, $5 million for geological and geophysical research, $1 million for exploration wells and preliminary expenses and $1 million for general expenses and staff salaries. At least $2 million have been spent previously in geological and geophysical exploration by International and Socony in geological and geophysical surveys in eastern Peru. These figures, of course, do not include the capital issues of the newly constituted companies in Peru.

British Exhibition Brings Out New Products and Processes

By E. Lawson Lomax

The annual Engineering, Marine and Welding Exhibition held in London grows in importance year by year. At the 1953 exhibition, which took place in the first half of September, most of the heavy engineering firms of the United Kingdom had displays and many improvements in engineering accessories and instruments were shown.

Among exhibits which had a topical appeal for many visitors was the unit for the measurement of engine wear, designed and made at the Thornton Research Center of the Shell Petroleum Co. in co-operation with the Atomic Energy Research Establishment at Harwell.

The useful life of internal combustion engines is usually limited by wear of cylinder bores and pistons and a large amount of research work has been carried out to determine what are the factors affecting this wear, the sources of undue wear, and methods of reducing it to a minimum. In the past, the experimental work has been carried out on standard engines, which have had to be run for long periods, under closely regulated conditions, after which wear has been estimated by comparison of the weights and sizes of piston rings before and after the test, measurement of minute increases in cylinder bore by delicate instruments and inspection of the surfaces.

These tests involve the stripping down of the engine and re-assembly. In addition, the original bedding of the engine is disturbed, resulting in high wear rates in the initial running of the test and so necessitating carrying out a test run for a long period if reliable comparisons are to be obtained.

The new testing unit gives the answer to these problems without the necessity of long continued tests and engine stripping.

The principle of the test is the fitting of a radio-active piston ring in the engine and the measurement of the radioactive particles in the lubricating oil. As the only part of the engine or lubricant which is radio-active is the piston ring, it follows that any increase in radio-activity of the oil, into which the particles due to wear are washed, is due to these particles, and a measurement of the oil's radio-activity must be a measure of the wear on the piston ring. The methods of measuring radio-activity are extremely sensitive and accurate, and so a continuous measurement of wear rates is possible.

The treatment of a cast iron ring in a nuclear reactor results in a small portion of the atoms being transmuted into radio-isotopes of iron; these isotopes are distributed evenly in the mass and still are identical in chemical and physical properties. When a small amount of the piston ring becomes abraded or corroded, the wear debris finds its way into the oil and in the oil the gamma radiation can be counted either by means of a Geiger-Muller tube or more sensitively by a scintillation crystal.

Before returning to the sump, the oil is passed through a "Castle" containing the crystal and radiations are converted to an electrical signal by the use of a sensitive photo-cell, the signals then being counted by an electronic apparatus which functions at high speed, or they can be averaged on a rate-meter which automatically computes a running average and displays it on a clock-driven chart, thus giving an accumulated record of wear against time.

The method also can show rapidly and convincingly the effect of addition to the oil of traces of anti-wear additives, as well as the changes in wear rates due to changes in running conditions in the engines, such as load increase or reduction as well as temperature changes.

Bubble Tray Components

Metal Propellors Ltd., Croydon, Surrey, have devised a unique method of showing bubble tray components for comparison against one another. This build-up is shown in the accompanying photograph which is self explanatory.

Lincoln Stud Welder

Lincoln Electric Co. Ltd. has brought out a new stud welder which eliminates electrical timing, is based on simple mechanical principles and can be operated by an unskilled operator after a little tuition and practice.

A sectional view of the welder shows the construction and operation.

"A" is the stud chuck into which the stud "H" is loaded. This chuck is carried on the spindle "B" which slides in the guide "C" and is connected to the lower end "D" of the hydraulic bellows unit "DEF". This is the timing unit which directly controls the stud movement and the duration of the welding arc. It is independent of any electric supply and is adjusted on the gun itself by rotating the graduated control stock "G," which limits the spindle travel abutting on the end of the guide "C," provision being made to lock it in position when the correct timing has been established.

The center flange "E" of the hydraulic unit is fixed to the body of the gun. A spring "M" holds the spindle and bellows unit in the downward position. The hydraulic unit is a completely sealed system and is devoid of any glands or joints which could allow leakage of the operating fluid or the entry of dirt or grit.

The gun is fitted with a spring loaded foot "P" which retracts when pressure is applied and may be locked in any position by the lock "R" operated by the lock lever "Q." The leg may also be telescopically adjusted for its free length to suit the various lengths of stud being welded. To do this the clamping screw "T" is slacked off, the length of leg adjusted and the screw re-tightened. Slight variations in stud length are catered for without adjustment.

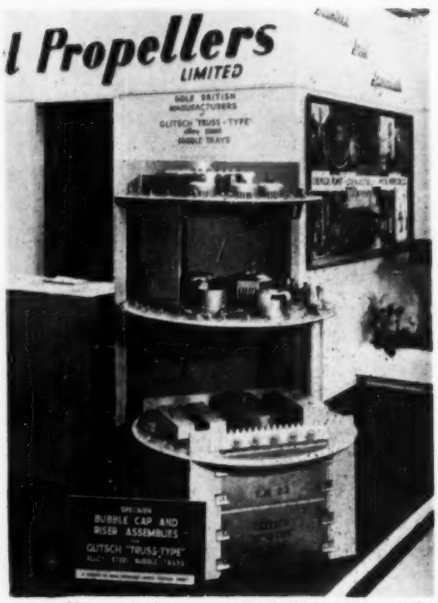
The initiating switch "S" is conveniently located on the side of the gun, audible warning being given by the contactor when the circuit is closed. For safety reasons the current required to operate the switch is transformed down 24 volts.

The ferrule "U" is of unique design, being reversible with one end providing a neat collar round the base of the stud while the other gives a spoked effect. The method of operation is as follows:

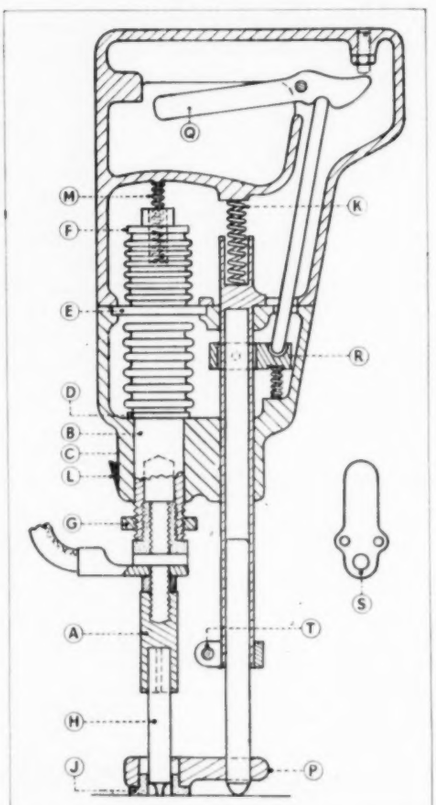
The stud with a fusible tip is inserted in the stud chuck, the leg being set as described above, and the ferrule placed in the ferrule holder. The stud is then positioned on the workpiece and the tool gripped by the handle is pressed against the plate until the indicator "L" disappears.

The local lever "Q" is then gripped, the button "S" pressed and the welding operation then commences.

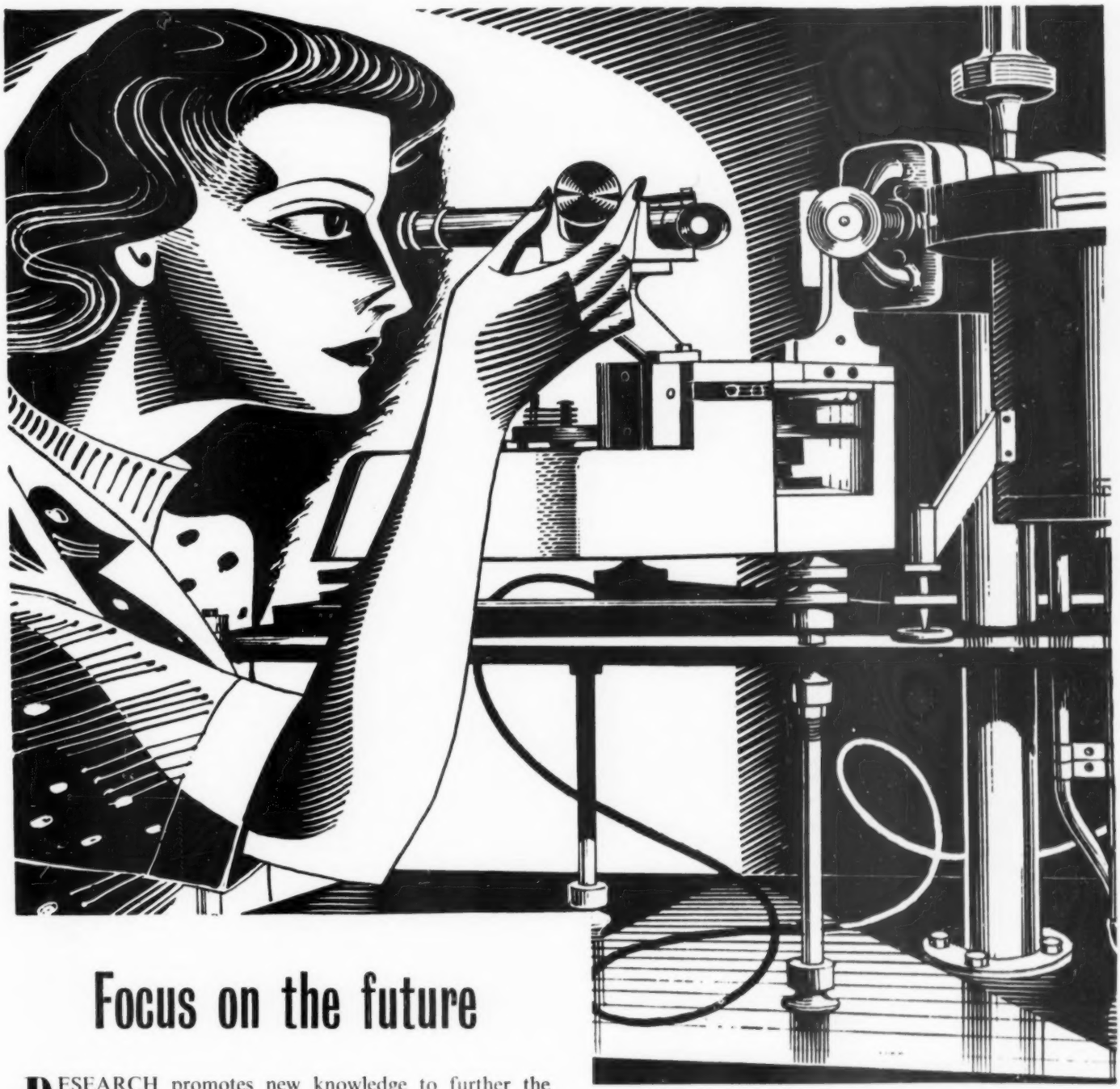
When the initiating switch is closed the contactor connects the supply and the welding current flows to the circuit. Almost instantaneously the tip of the stud fuses, creating an arc gap so that the whole reaction of the thrust on the gun is taken by the locked leg, and the stud, now unsupported, is carried down by spring "M" under the control of the hydraulic bellows unit. The timing of the arcing period, therefore, is initiated at the moment of arc formation and not prior to it, so that any delay in the establishment of the arc is not included in the timing period.



View of the composite bubble tray exhibit shown by Metal Propellers Ltd. on their stand at the Chemical Plant Exhibition.



Schematic diagram of the Lincoln stud welding gun.



Focus on the future

RESEARCH promotes new knowledge to further the wide activities of Anglo-Iranian Oil Company. Knowledge that means new uses for oil; new efficiency in refining; new economy in operation.

Plant and equipment keep pace with this progress. Anglo-Iranian now has three cat-crackers in operation in Britain; two more than any other company. Platformers are being installed at the Lavera and Hamburg refineries. Two new refineries are being built; one at Aden and one at Kwinana in Western Australia.

Hundreds of specialists at its Research Stations are keeping Anglo-Iranian in the forefront of the world petroleum industry.

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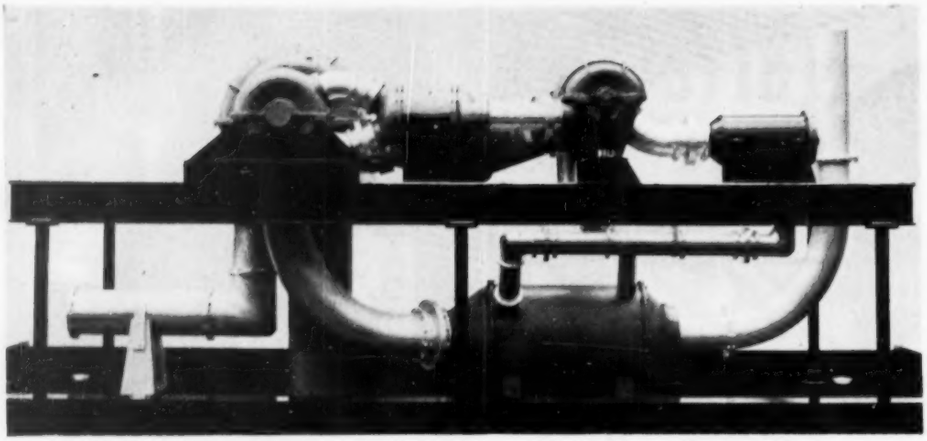


Model of dual-fuel gas turbine compressor set being constructed by Harland & Wolff for a large sewage disposal works.

New Gas Turbine

One of several firms entering into the manufacture of gas turbines is Harland & Wolff Ltd., Belfast, who are making such a machine for use in a large sewage works.

The fuel used will be sewage gas with oil as a stand-by should the supply of sewage gas fail. The purpose of the unit is to supply 25,000 cubic feet of air per minute at 7.5-8 pounds pressure for sewage aeration.

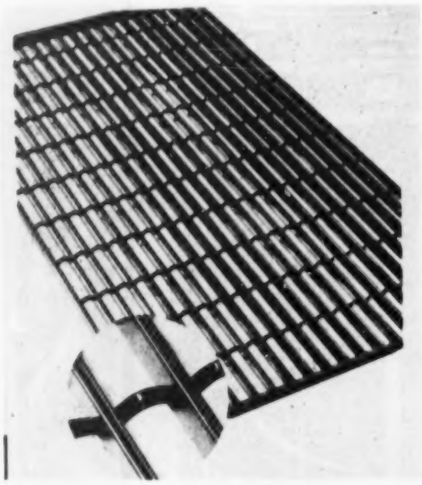
The horsepower required for this service is about 1,100.

The coupling between the power rotor and the compressor is supplied by "Metastreams," one of the company's well known flexible couplings.

Steel Floor Panels

Chamberlain Industries Ltd., Staffa Works, Leyton, have produced a new type of floor panel and stairtread specially designed to produce maximum margin of safety, at the same time permitting unrestricted transmission of natural light.

The flooring consists of a longitudinal arrangement of mild steel bars, pierced at regular intervals by transverse rods, pressed and locked into a



U shape, which simplifies cutting and shaping without any sacrifice of strength, while specially raised nipples on the transverse rods provide an additional grip for the feet and prevent any danger of slipping.

They are considered especially suitable for stairways, platforms and catwalks in all types of petroleum refinery and distribution plants.

Pneumatic Time-Delay Relay

Electro Methods Ltd., Stevenage, Herts, have developed a pneumatic time delay relay for controlling accelerating contactors of motor-starters; timing the opening and closing of valves in refrigerating plant; controlling sequential process operations in which accuracy and reliability are essential; and for the delayed starting of loop-circuit electrical equipment, thereby eliminating high mass-starting circuit.

The pneumatic time-delay relay is a single-pole change-over switch in which "make" or "break" timing can be set to operate over the range of 1/6th to 180 seconds. It comprises a compact pneumatic system and a robust solenoid in a fully-tropicalized case of cast aluminum.

The pneumatic system, which is actuated by the solenoid, consists of a spring-loaded bellows of synthetic rubber and an adjustable air valve for controlling the rate of expansion. This system affords greater accuracy over a considerably wider timing range than is possible with the conventional dash-spot system. The air valve is positive in operation, maintains its accuracy over long periods, and is not affected by vibration or by small variations in temperature.

The solenoid is a rigidly constructed assembly of low-loss silicon-iron laminations, with a fully impregnated coil and shaded-pole plunger. The shading ring is accurately positioned and ensures a high sealing pull and silent operation.

With the solenoid de-energized, the solenoid p'unger is withdrawn from the coil by spring-loading and the bellows are simultaneously compressed. On energizing the solenoid, its plunger is instantaneously pulled back into the coil, thereby permitting the bellows to expand under its own spring tension. The duration of the expansion time is pre-determined by regulating the air-valve. At the conclusion of the expansion cycle, a snap action "double-break and make" switch is automatically engaged and held until such time as the solenoid is de-energized, whereupon the switch contacts snap over and the solenoid plunger is withdrawn to re-compress the bellows.

Glass Sink Traps

A new sink trap has been patented by James A. Jobling & Co. Ltd., Sunderland, manufacturers of "Pyrex" glass ware. The trap is non-corrosible to all liquids used in laboratories, except hydrofluoric acid. Being made of glass, any blockage is visible and it can readily be opened for cleaning by removal of the attached stopper.

Differential Converter

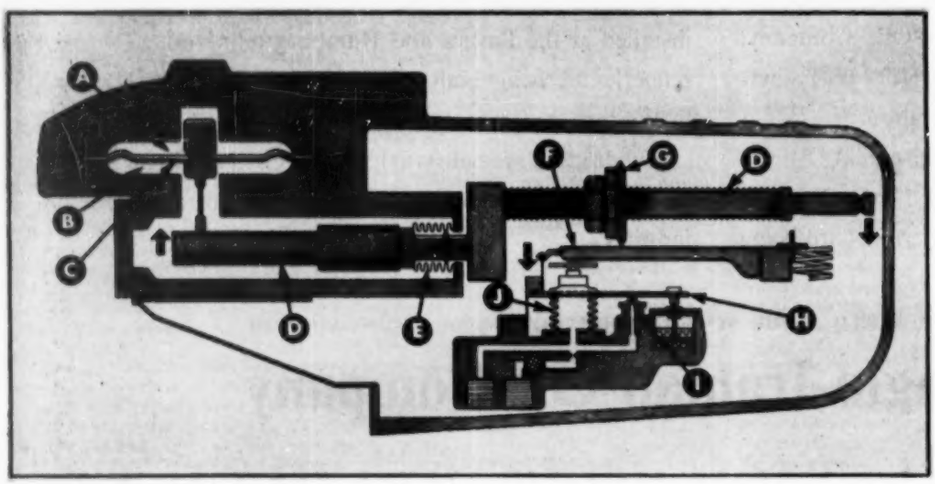
Honeywell-Brown Ltd. presented, in addition to their range of industrial instruments, a differential converter. This instrument is a pneumatic-balance flow transmitter, in the form of a mercuryless type of manometer. It has been developed to meet the need for an instrument which has faster, more accurate response to rapid change in flow, providing control within narrower limits and, at the same time, is easy to install and maintain.

The converter operates on the pneumatic-balance principle, whereby the force of the differential pressure across the flow orifice (or from any other source) is opposed by the force of air pressure acting in a weigh-beam system similar to that found in analytical balances. Air pressure developed to balance the force thereby becomes a measure of differential pressure or flow, and is transmitted by a single air line to a pneumatic receiving instrument in the form of an indicator recorder or controller.

As shown in the accompanying illustration, the low and high pressure chambers (A and B) are separated by a flexible diaphragm (C) which is connected to one end of a primary beam (D). The beam extends through a sealing bellows (E) which confines the measured fluid within the high-pressure chamber. Near the bellows is the fulcrum for the primary beam. Toward the opposite end of this beam is a bevel-edged rider (G), which is movable, to provide the range-changing feature, but which can be considered a fixed knife-edge in the operation of the unit.

Differential pressure in the meter body thus creates an upward force on the left hand end of the primary beam. Because of the intermediate fulcrum on the beam, this force acts downwards on a secondary beam (F) through the bevel-edged rider. As shown in the diagram, the right-hand end of the secondary beam is a fixed fulcrum point, while the other end is linked to a flapper (H). The downward force on the secondary beam thus moves the flapper toward a nozzle (I).

Air pressure from the supply is bled through a restriction into the pneumatic-balance system which comprises the flapper and nozzle and a balancing bellows (J) as illustrated. Thus, when the nozzle is covered, air pressure builds up in the balancing bellows and an upward force is created in opposition to the downward force due to the differential pressure. In this manner, out-put air pressure from the converter is directly proportional to the measured differential pressure and by means of a pneumatic receiver bellows can be transmitted directly in terms of flow or differential pressure readings.

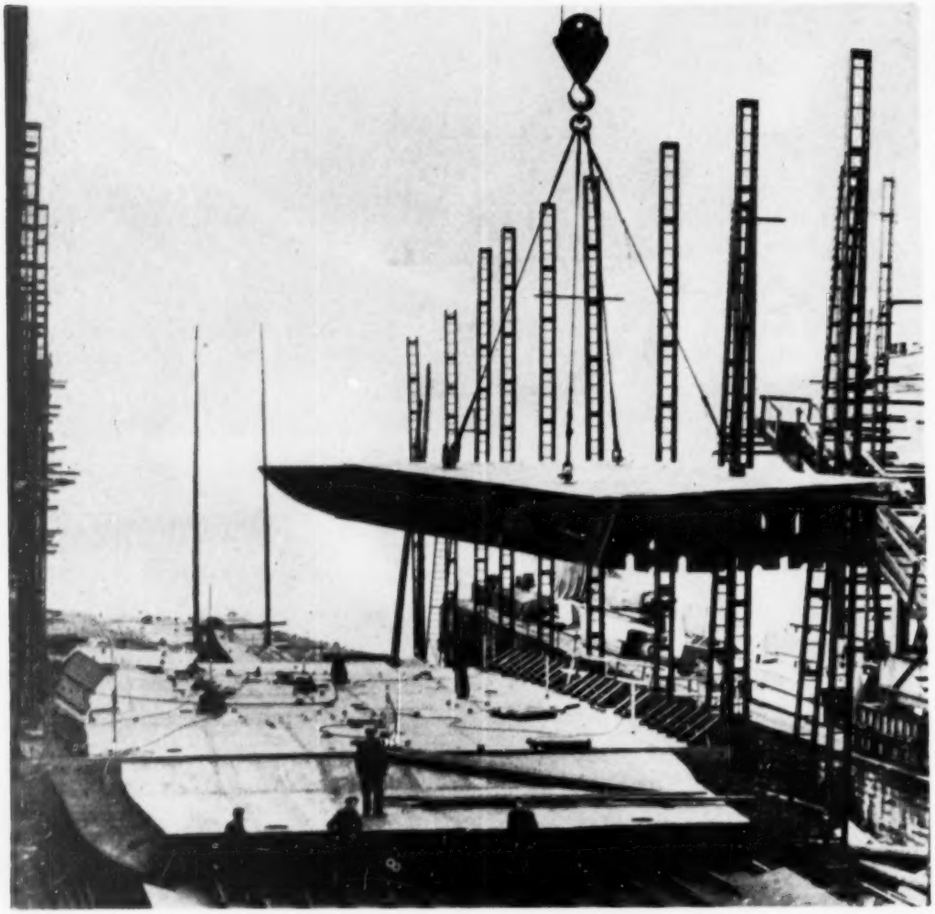


Cut-away view of the Honeywell-Brown differential converter.

"We are continually making progress through chemistry, physics, engineering and all the related natural sciences. But it was never more clear than it is today that 'the proper study of mankind is man,' and that the most difficult issues we have to face are in the field of human relations... Our problems are more in getting along with each other than they are in conquering stubborn and mysterious natural surroundings."

STANDARD OIL COMPANY
(NEW JERSEY)

AND AFFILIATED COMPANIES



Left, illustration of typical application of new "Vitrac" electrode for high-speed welding in tanker construction. Below, center, new "Silvac" electrode for fillet welds.

New Welding Electrodes

Rockweld Ltd., Commerce Way, Croydon, Surrey, have developed a series of special purpose welding electrodes.

"Vitrac" has been developed for rapid deposition of metal in long runs such as are encountered in shipyards in tanker building. It is claimed that the rate of deposit is 10 percent greater than with the normal electrode, and also that time is saved on butt and fillet welds by its easy de-slagging properties.

"Mixend 55" is a new 55 percent nickel alloy designed especially for the welding of the new semi-ductile cast iron of the spheroidal graphite type, and is suitable for the making of strength welds in normal grades of cast iron.

"Chromolac 1A" is one of a series of new electrodes developed specially for the welding of high creep resistance steel of one percent chrome and one-half percent moly.

"Chromac N" is a new electrode of 80 percent nickel-20 percent chrome core wire for the welding of heat resisting alloys used in jet and gas turbine components.

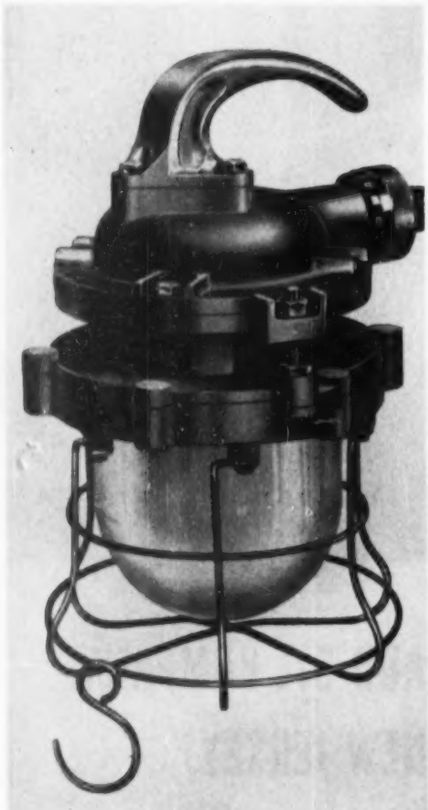
"Silvac" is designed for use in mild steel fabrication where surface appearance is of primary importance.

New Plug Valve Lubricant

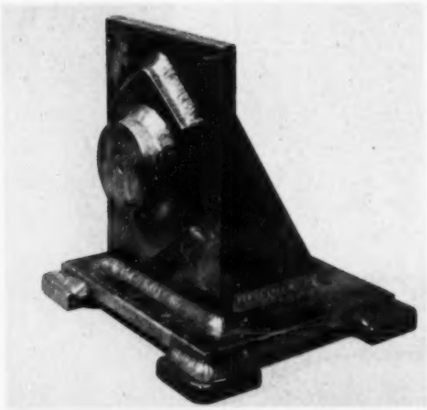
A lubricant for plug valves which will function satisfactorily under widely varying temperature conditions and be completely inert to a large number of corrosive chemicals or active solvents has been developed in the research laboratories of the Audley Engineering Co. It is designated as No. 631 and forms a thin, strong and highly adhesive film which will not break down under extreme pressures and temperatures. It is also inert to a wide range of corrosive acids, alkalis and other chemicals, to liquid hydrocarbons, aromatic and aliphatic asphalts, and many petrochemicals as well as brine and water.

Flameproof Handlamp

Simplex Electric Co., Oldbury, Birmingham, have introduced a flameproof handlamp for use in dangerous atmospheres as defined in BSS 299 (Groups II & III) which has been granted a Certificate of Flameproofness by the certifying authority at Buxton, and which is suitable for all voltages up to 250 (250 volts earth). In the United Kingdom this handlamp is only to be used in conditions approved by the factory inspector, this being a general requirement for all handlamps.

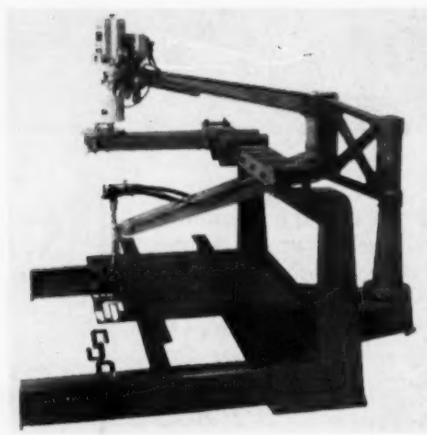


The "Simplex" flameproof handlamp of Simplex Electric Co.



Sigmund "S.R." Pump

Sigmund Pumps Ltd. of London exhibited a new single shaft centrifugal pump, the construction of which eliminates base plates, couplings, belts and pulleys. It also has a patented arrangement of ventilation and the stator unit, in case of electrical breakdown, is simple to withdraw and replace. Its ease of installation enables it to be applied to a diversity of applications in many fields.



Hancomaster Profiling Machine

Hancock & Co. (Engineers) Ltd., Croydon, Surrey, have developed a new profiling machine which can be used with equal facility for rapid production work and with easy and convenient methods of obtaining one-off. Controls are conveniently grouped round the tracer head, which is of the Hancock type UT4 which permits a choice of five drives, using templates of steel, aluminum strip, plywood or hand guiding round a drawing.

Hancock & Co.'s new "Hancomaster" profiling machine.

FLUOR
will build the
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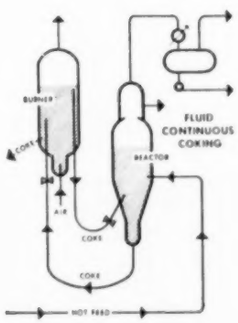

FLUID COKING

Fluid Coking is a continuous coking process, recently perfected by the Standard Oil Development Company after four years of research. Heavy residual fractions can be cracked for higher yields of light products — far beyond the limits of delayed cokers. Fluid cokers supply their own heat, no furnace is required, coke yields are less and over-all costs are lower. For details on Fluid Coking, contact your Fluor representative.

FOR IMMEDIATE RELEASE:

"BILLINGS, MONTANA,... CONTRACT FOR A NEW FLUID COKING UNIT, FIRST COMMERCIAL INSTALLATION OF ITS KIND IN THE WORLD AND A PROCESS WHICH WILL GREATLY INCREASE THE GASOLINE, TRACTOR AND DIESEL FUEL OUTPUT AT THE CARTER OIL CO. REFINERY HERE, HAS BEEN LET TO THE FLUOR CORPORATION, I. J. STAID, MANAGER OF MANUFACTURING FOR CARTER, ANNOUNCED TODAY.

"WHILE ACTUAL CONSTRUCTION OF THE NEW UNIT WILL NOT BEGIN UNTIL SPRING, ASSEMBLING OF MATERIAL AND DETAILED ENGINEERING WORK WILL GET UNDERWAY IMMEDIATELY...STAID INDICATED THE UNIT IS THE FIRST STEP IN EXTENSIVE MANUFACTURING DEPARTMENT EXPANSION... THE CARTER UNIT PROBABLY WILL BE COMPLETED AND READY FOR OPERATION BY OCTOBER OF 1954."

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BRITISH OIL NEWS

By E. Lawson Lomax

The news from Persia regarding the oil situation seems to indicate that the Prime Minister, General Zahedi, has realized that a conciliatory attitude to Great Britain and the Anglo-Iranian Oil Co. will have to be the future policy of his country if he is to save it from bankruptcy, toward which it was rapidly drifting under the zenophobic attitude adopted and fostered by the deposed Prime Minister, Dr. Mossadeq.

Undoubtedly, the development of this reasonable attitude has been largely assisted by the visit of the United States oil expert, Herbert Hoover, Jr., who seems to have instilled into the minds of the present ruling faction the fact that the world is in no way dependent on oil supplies from Persia, partly due to there being no world shortage of crude oil at the present time and no immediate prospect of such a shortage.

It is well known also that the present oil industry in Persia is working at very heavy losses and also it is stated that its employees are very dissatisfied with present conditions.

The recovery of the oil industry, even under the most favorable future conditions, must of necessity be a long term project as Persia will now have to enter the industry and takes its place as a newcomer, no matter how peace is arranged.

Prior to the nationalization of Persia's oil industry, Abadan refinery was the main supplier of refined products to Middle and Far East markets, but cannot in future occupy such a favorable position, as new refineries are being established in the Middle East, such as the new Aden refinery of the Anglo-Iranian Oil Co. and the new refinery of the Iraq government now in course of erection near Baghdad, while the other established refineries at Ras Tanura, Bahrain and Kuwait have increased their operations. In addition, new refineries are being built in Australia, India and Pakistan while the throughputs of the Netherlands East Indies refineries have also been increased.

It is doubtful, therefore, whether it will ever be a profitable proposition to bring the Abadan refinery back to its former capacity, as these new and enlarged refineries will probably be able to take care of the present markets and any normal future increase for some years. In addition, these new refineries will be more economical than a revitalized Abadan, as a large amount of the plant there has become obsolescent.

Drawing attention to these facts is not to imply that Persia has no place in the future in the world petroleum industry, but rather that it will not occupy its prominent position of the past. Nevertheless, a settlement of its petroleum problems on an equitable and amicable basis would be welcomed by the whole of the free world, rather than that conditions in Persia should deteriorate to such an extent as to render it more open to the subversive influences of Communism.

It is a far cry from Persia to the Scandinavian countries, but from information received from very reliable sources, the fact emerges that the USSR is conducting a considerable marketing drive there, and importing large quantities of fuels at cut rates. Some of these fuels are imported on a barter agreement, but a large amount is direct cut trade.

Kent Refinery Cracker Operating

The cat cracker at Anglo-Iranian Oil Company's Kent refinery has now been completed and successfully put on stream, so that the company now has three cat crackers completed and working in the U.K. The cost of erection of these three plants was approximately £10 million.

The vacuum feed preparation stock for this latest cat cracker is also on stream and an SO_2 plant for the production of premium grade kerosine is due for commissioning. Good progress is also being made in the erection of the lubricating units as well as in the erection of a Platforming unit.

Petrochemicals Ltd. Annual Report

The annual report of Petrochemicals Ltd. for the year ending June 30, 1953 shows that great changes have been made in the direction and management, and a decision has been taken that the company must be an entirely independent one, divorced completely from any particular plant construction companies or oil refineries and classed solely as a chemical manufacturing company.

During the year, plant efficiencies have been improved and costs reduced. The consolidated profit and loss account shows a total debit of £4,211,495 to June 30, 1953, but the loss of the parent company for the year has been reduced to £866,803, as compared with £1,339,340 for the previous year. The loss is mainly due to interest on fixed loans and amortization and depreciation.

Manufacturers of Petroleum Equipment Meeting

The tenth anniversary general meeting luncheon of the Council of British Manufacturers of Petroleum Equipment was held at the Dorchester Hotel October 15 with 600 in attendance.

At the Council's first general meeting in 1943, S. T. Robson, founder and chairman, spoke to representatives of 92 member-firms. He stressed the encouraging support given to it during its formation by Geoffrey Lloyd, then parliamentary secretary to the Petroleum Division. At the present meeting, Douglas Wilson, chairman of the council, addressing representatives of nearly 400 member-firms, welcomed the Rt. Hon. Geoffrey Lloyd, M.P., Minister of Fuel & Power to H.M. British Government, as the principal guest and speaker.

Mr. Wilson in his address stressed the fact that although the manufacture of petroleum equipment in the United Kingdom had risen to over £91 million in the past year, yet a large amount of this equipment had been built up on the technical "know how" from other countries, mainly the U.S.A., and that it was now time by intensive research to develop domestic designs and processes and keep abreast of the rest of the world.

New Shell Tanker Company

A new company, Shell Tankers Ltd., was formed on November 1 to deal with the management and operation of the Shell fleet. It is a 100 percent subsidiary of the Anglo-Saxon Petroleum Co. Ltd., one of the three main operating companies of the Royal Dutch/Shell Group, which has hitherto been manager of the "Shell" fleets.

While the Anglo-Saxon Co. will retain ownership of its tankers, the new company will take over all operation responsibilities and will also negotiate charters and contracts on behalf of the parent company.

The change is for purely corporate reasons and to identify the "Shell" name with the Royal Dutch/Shell Group's marine affairs.

The board of directors will include J. W. Platt, chairman and managing director; Sir Francis Hopwood, managing director; A. S. C. Hulton, managing director; John Lamb, W. F. Pascoe, J. H. Kirby, A. Logan, Capt. H. B. Russell, and A. J. Rycroft, directors; and B. E. Blakely, secretary.

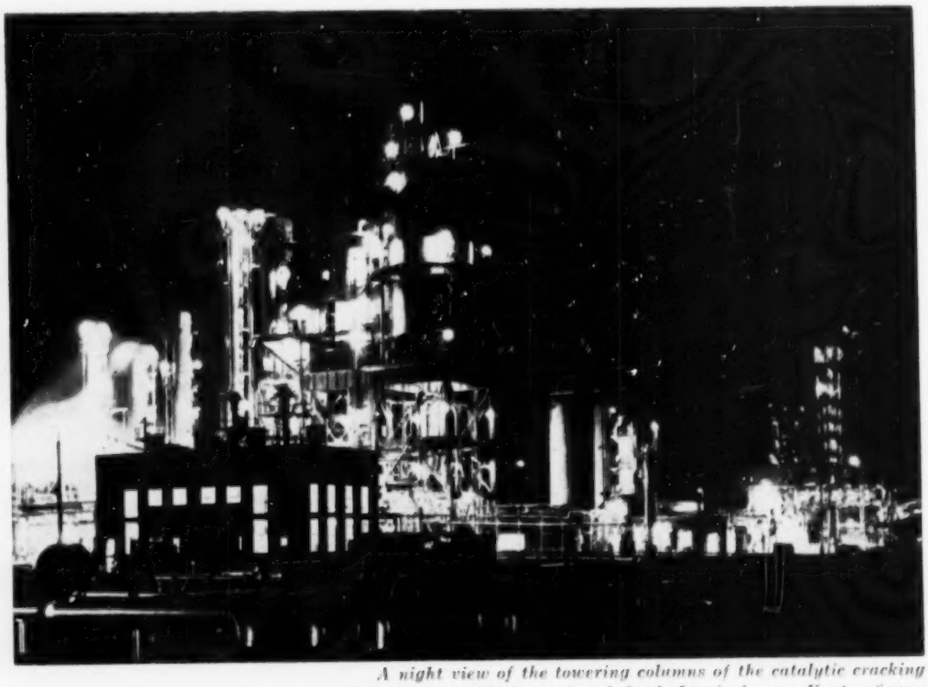
The present owned tonnage of the Shell Group is 2¼ million deadweight tons, which together with 4½ million dwt on charter, gives a total operated amount of 6¾ million dwt.

The present building program of 73 vessels due for completion by 1957 will bring the owned tonnage up to nearly 4 million dwt.

Messrs. Harland and Wolff Ltd., announce that the motor tanker "Jaranda" of 18,500 dwt capacity, built for Anders Jahre & Co. of Sandefjord, Norway, was successfully launched at the Belfast Shipyard on October 23.

Microwaxes to be Made at Llandarcy

The erection of special plant at the Llandarcy refinery of the Anglo-Iranian Oil Co. for the manufacture of microcrystalline waxes is almost complete, and production will commence before the end of the year. Hitherto these waxes, which are more flexible and ductile than normal paraffin waxes and can be produced to higher melting points, have been imported from the United States.



A night view of the towering columns of the catalytic cracking plant and distillation units of Anglo-Iranian's new Kent refinery.

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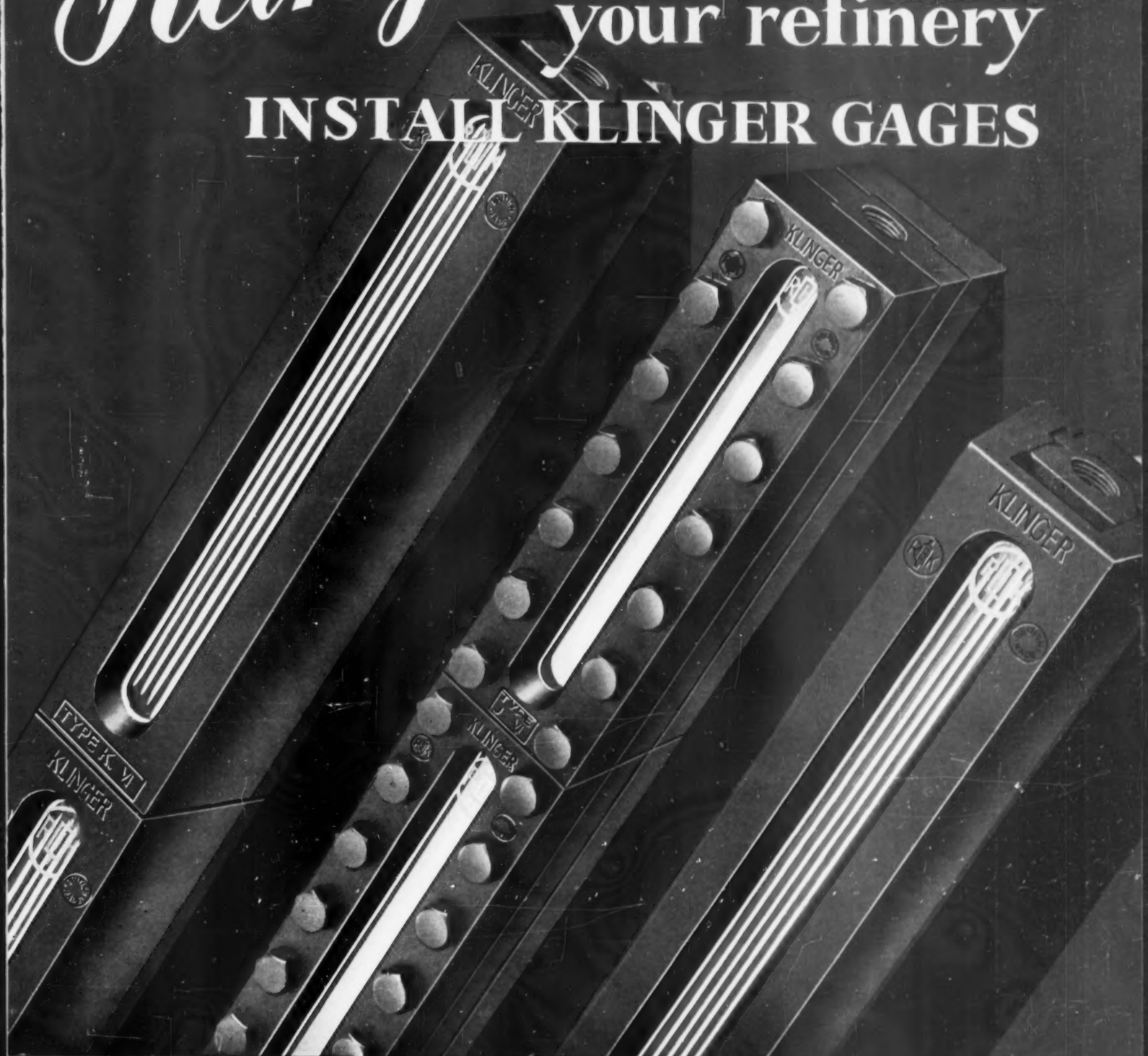

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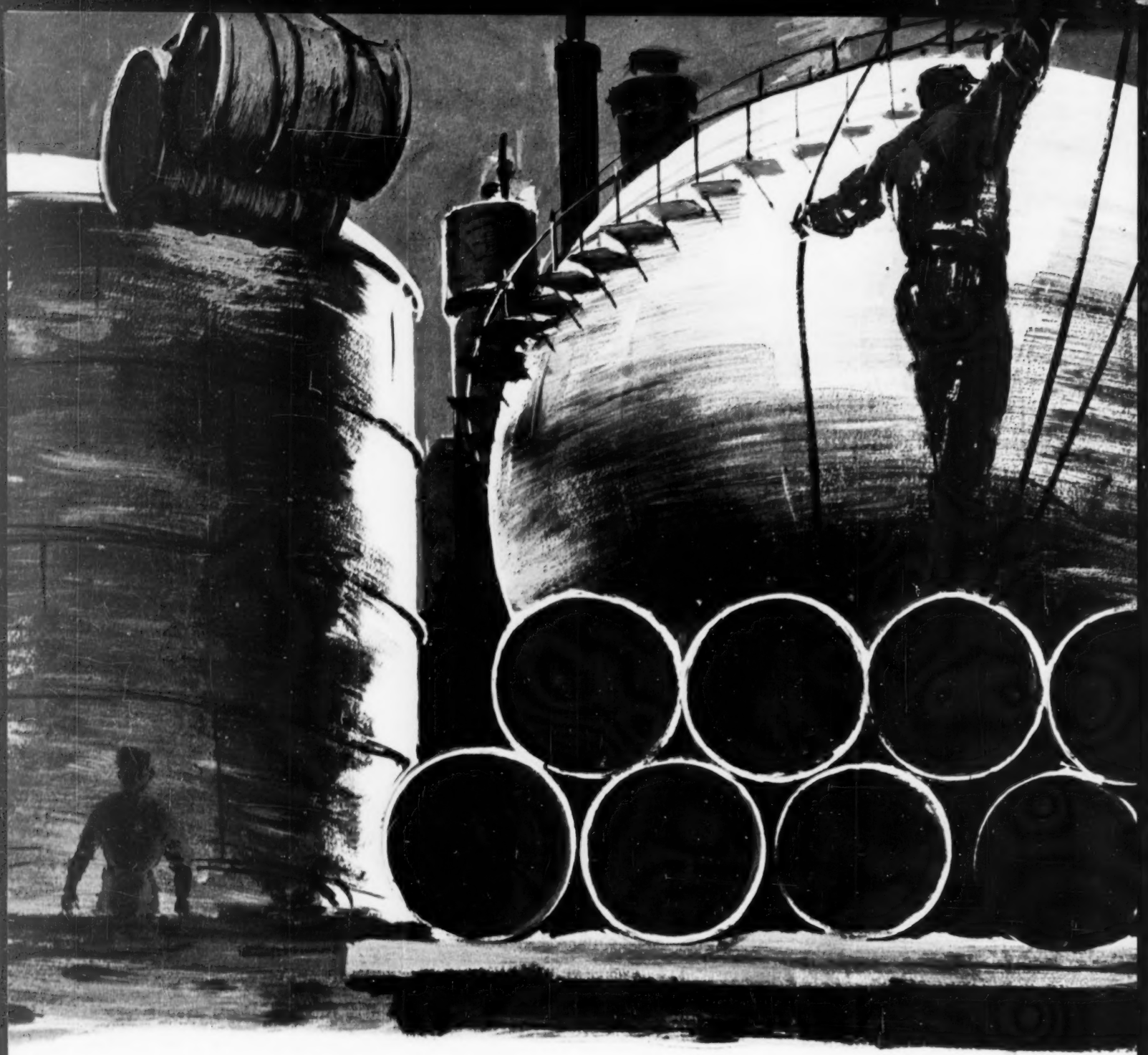


Confidence — the reward of decades

BOILERS

DRUMS

AND BARRELS

The successful practical application of the results of technological advance for the benefit of industrial production depends largely on an adequate supply of oil fuels and lubricants. These, in fact, play a vital part in ensuring the high living standards of modern civilization.

The refining procedure to which crude oil is subjected in order to obtain power fuels and lubricants, requires highly complicated chemo-physical processes which are characterized by ever increasing service pressures and temperatures. These processes became practicable only with the invention of the famous Mannesmann seamless steel tube about six decades ago. A definitely superior product even then, it has been progressively developed and perfected ever since.

In equipment for the transportation and storage of oil fuels and lubricants, Mannesmann has long been enjoying a world-wide reputation as supplier of a full range of pipe lines, boilers, drums, barrels, cylinders and containers in virtually every form to suit each and any particular requirement.

MANNESMANN-EXPORT GMBH DÜSSELDORF

Search for Oil in England

The test well being drilled by D'Arcy Exploration Co. at Plungar, 12 miles east of Nottingham, has produced a small quantity of oil and drilling is continuing. The depth is over 2,900 feet, about 80 feet below where oil was struck. An extensive seismic survey is in progress near Plungar.

Passage of a Veteran

A high-vacuum lubricating oil distillation bench built in 1924 at Shell's Shell Haven refinery for the production of lubes and bitumen from Venezuelan topped crude recently was decommissioned. Present at the informal ceremony setting in motion the dismantling were John A. Oreil, chemist in charge of the bench on starting up, now consultant to Shell's personnel administration department; H. B. Parsons, one of the refinery's senior engineers who worked on the construction and later maintenance of the bench; E. le Q. Herbert, general manager "Shell" Refining and Marketing Co. Ltd.; and J. Grant, the present refinery manager.

Personnel

Sir William Fraser, chairman of the Anglo-Iranian Oil Co. Ltd., has been created an Officer of the Legion of Honor, the insignia being presented to him by M. Louvel, Ministry of Industry and Commerce, at a luncheon in Paris on October 5.

The award is for his services to the French national economy and marks the French Government's appreciation of the help given by Sir William and the AIOC in the construction of the Dunkirk refinery and in overseas marketing of the products of the company's associate, Societe Generale des Huiles de Petrole B.P.

The Kuwait Oil Co. Ltd. announces that E. A. V. de Candole has been appointed head of the Department of Arab Affairs which deals with relations with the interested departments of H. M. Government and the Government of H. H. the Ruler of Kuwait as well as information, publicity and public relations generally.

Kenneth J. Balsillie, managing director of Esso Transportation Co. Ltd., retired on September 30 after having served the shipping interests of the Esso group for nearly 50 years.

When he joined the then Anglo-American Oil Co. Ltd. in 1904, in addition to a large tanker fleet they owned the largest fleet of sailing ships in the world. He was appointed assistant manager of the shipping department in 1916 and manager in 1929. In 1946 he became managing director of Esso Transportation Co. Ltd., whose newest super-tanker, the 26,650-ton "Esso Westminster," was recently launched.

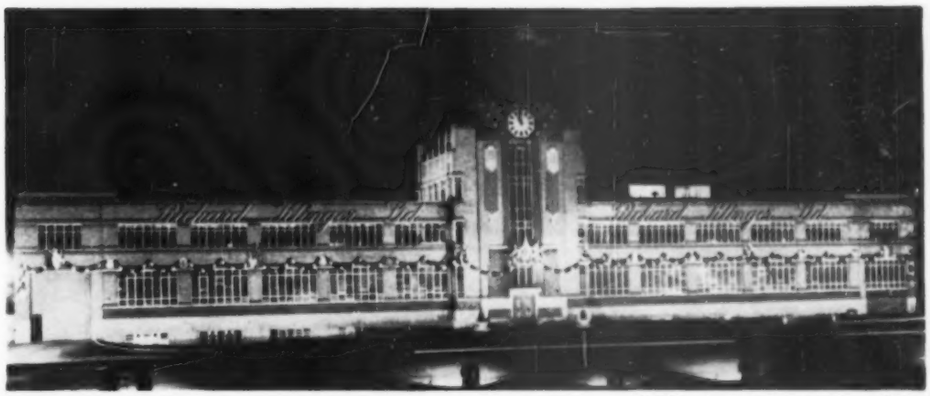
He has been a representative of the Britannia Steam Ship Insurance Association on the Council of the Chamber of Shipping of the United Kingdom and Executive Council of the Shipping Federation Ltd., for many years, and has served on the tanker committees of those bodies.

During the Second World War he was a member of the Tanker Tonnage Committee of the Petroleum Board, also a consultant of the Ministry of War Transport on tanker matters. He recently served on the Government Committee on the Prevention of Pollution of the Sea by Oil. He is a director of the Persian Gulf Lighting Service and H. Clarkson & Co. Ltd.

L. H. Coney has been appointed lubricants coordinator, Shell-Mex and B.P. Ltd., responsible directly to A. M. Mackintosh, general sales manager.

Mr. Coney took his degree in natural sciences at King's College, Cambridge in 1927 and immediately after joined the British Petroleum Co. Ltd. He was made assistant manager for Shell-Mex & B.P. at Ipswich in 1938, and afterward served in the same capacity in Manchester. During the war he was with the Lubricating Oil Pool and was awarded the M.B.E. in 1946 for his war service.

Afterwards he was appointed manager of Cardiff division in 1948, and manager, western division, Bristol in 1950. For the last two years he has been at the head office.



Night view of Klingerit works at Sidcup, Kent, showing Coronation decorations.

Crude Oil Production

Crude oil production in the Near East for September 1953 was as follows:

	PRODUCTION FIGURES LONG TONS
Iraq Petroleum Co. Ltd., Kirkuk Field	2,012,968
Basrah Petroleum Co. Ltd., Zubair Field	244,256
Mosul Petroleum Co. Ltd., Ain Zalah	111,130
Qatar Petroleum Co. Ltd., Qatar	351,482
Kuwait Oil Co. Ltd.	3,347,603
Aramco (U. S. Barrels)	25,078,048

Progress at Kwinana Refinery

The first refining unit—a locally manufactured pressure tower for the production of premium grade kerosine—has been erected on the site of the AIOC refinery at Kwinana, Australia. Foundations have been poured for two distillation units and a cat cracker.

Since clearance of the site began on October 1, 1952, over £8,500,000 worth of orders have been placed with manufacturers for plant and materials, of which more than half have been placed in the U.S. and £3 million in Australia.

More than 100 houses built by the Western Australian Government have been completed and handed over for rental by construction employees at the new township of Medina, and a further 200 are in course of erection there. Building has also commenced at a second neighboring township which is to be called "Calista."

New Petrochemical Plant

Construction work will begin soon at Wesseling, between Cologne and Bonn, on the first plant in Western Germany to make polyethylene and ethyl benzine from petroleum. The operators of this venture will be "Rheinische Olefinwerke GmbH," jointly owned by Badische Anilin und Soda-Fabrik A.G. and Deutsche Shell A.G. Refinery gases from the nearby oil refinery will provide the feed stock and production is planned to begin in 1955.

Middle East Oil Pioneers Honored

A remarkable foursome of Middle East oil pioneers were guests of honor October 13 at a luncheon in London attended by a large number of their Anglo-Iranian colleagues and distinguished representatives of the petroleum industry. The four guests were Dr. G. M. Lees, president of the Geological Society for 1952 and 1953; D. Cousins, R. Davies, and G. W. Colvill, who have all recently retired, after 30 or more years' service, from the positions of AIOC chief geologist, chief petroleum engineer, chief geophysicist, and drilling manager respectively. Mr. Colvill unfortunately could not be present owing to illness.

Hosts at the lunch were J. M. Pattinson and E. H. O. Elkington, managing-directors of AIOC. They were supported by J. A. Jameson, a managing-director until earlier this year, when he retired after 43 years' service. The latter was acclaimed by both hosts and guests as the resident captain in the Middle East of that area's original team of oil pioneers, in which the four guests had been prime contributors to the location and production of oil in regions which are now recognized as holding the world's largest reserves.

The unique contribution to petroleum technology and thus to modern civilization and its material wealth and well-being made by the four guests was illustrated in Messrs. Pattinson, Elkington and Jameson's speeches by anecdotes of their working lives in those early days.

Progress at Aden

Work has been commenced at Aden on laying the two pipe lines which will join the refinery at Little Aden to the B.P. international bunkering station, one of the biggest bunkering stations in the world, where more than 4,500 ship calls are made a year. There is one line of 16-inch diameter and one of six inches. Distance from Little Aden to Aden is 19 miles. As various grades of oil have to be pumped through the lines, "go-devils" fitted with radio-active capsules are employed to warn of the arrival of a new tender.

E. A. V. de Candole

Left, Kenneth J. Balsillie, Esso Transportation Co., and right, Leonard Sinclair, Esso Petroleum Co.

L. H. Coney

Industry's Surplus Capacity Studied At API Meeting

(Continued from page 45)

up to 10.2 percent, and this year, the way imports are running, it looks as though the ratio will be about 10.3 percent. In other words, over the past four years fluctuation has been within a range of 1½ percentage points, and the ratio of crude imports to domestic production east of the Rockies is lower for 1953 than it was in 1950.

"Jersey's own imports of crude oil in the past twelve months have actually been cut substantially," Mr. Suman said. "At this time in 1952, our domestic affiliates were importing about 103,000 barrels of crude daily. Today the figure is 82,000 barrels daily—a drop of 19 percent. And, at the present time, the ratio of Jersey's crude imports to refinery runs is lower than it has been in any of the post-war years.

"As I am sure you all know, we in Jersey believe that imports play an important supplemental role to domestic production. On many occasions over the past year, Jersey spokesmen have stated the view that such supplementation is consistent not only with the long-range preservation of national security, the interests of the American consumer and the sound growth of international trade, but also with the welfare of the domestic industry.

"We still hold to those beliefs we have expressed many times before—that imports are valuable and should be flexible, that a strong domestic industry is essential, and that the domestic industry is strong. That imports are playing a supplementary role is evidenced, we feel, by the fact that the domestic industry set an all-time record for production in 1951, topped it in 1952, set a new record in 1953, and will probably hit still another in 1954.

"With imports, as with so many other problems relating to our business, it is the long-range view that should be taken. Whether domestic production is up or down in any two or three months, or even in a single year as compared to another, is less significant than what the long-term trend shows is happening to the domestic industry. Despite present worries, it is my belief that the U. S. oil industry is fundamentally healthy. Problems like the one I've mentioned, and others like rising costs, are not new to us. We have been meeting problems for a long time —and solving them. The present difficulties will, I firmly believe, be solved.

LPGas Safety Precautions

Safety precautions for truck loading of LPGas have just been released by the Safety Committee of the Natural Gasoline Association of America. Cards written primarily for the supervising loader at loading racks have been printed in two sizes: letter size for posting at loading racks, and postcard size for posting in truck cabs. They are available from the offices of the NGAA, 422 Kennedy Building, Tulsa, at four and two cents each respectively.

Lays Submarine Pipe Line

The Tide Water Associated Oil Co. has commenced laying one of the longest submarine pipe lines in existence, an 18-inch line off the Pacific Coast shore at Ventura, Calif., to take crude from its Ventura field for off-shore loading of its company tankers. The marine pipe line will go out 4,300 feet into the Pacific Ocean and terminate in 42 feet of water. Capacity will be 9,000 to 10,000 barrels an hour.

The pipe line, which weighs 200 pounds per foot, is being given a somastic coating three-quarters of an inch thick to protect and insulate it from corrosion and erosion. An outer coating of gunite cement, one inch thick, is being applied to give the line weight to keep it submerged.

In 1887, Tide Water Associated became the first oil company to transport oil under deep water when it laid its early pipe line under the waters of Newark Bay and Staten Island Sound to its Bayonne, N. J., refinery. In 1924 the company completed at Ventura, Calif., one of the first submarine pipe lines to go under ocean waters. It now operates submarine pipe lines at Monterey, Gaviota, and Ventura, Calif.

H. J. Struth

Struth Joins Palmer Publications

Henry J. Struth has joined the editorial staff of Palmer Publications, according to an announcement by Mona Palmer, publisher. He is to be editor of the WORLD PETROLEUM STATISTICAL YEARBOOK. First edition of the new yearbook will be published in June 1954.

Mr. Struth has devoted his entire active business life of more than 30 years to the study of oil industry statistics and economics. He has been connected with oil trade association, government and trade journal activities.

Mr. Struth's writings on the economics and statistics of the petroleum industry have received widespread recognition, and have rated him an outstanding authority in his specialized profession. He has made many valuable contributions to the domestic and foreign petroleum industry through his papers and published articles, for which his sound views and analyses have been in popular demand. In 1952 he contributed a series of articles to WORLD PETROLEUM detailing the economic development of the oil industry in Venezuela.

During the last three years, Mr. Struth has operated his own business as a petroleum consultant in Dallas, Texas, during which time he was retained by the Venezuela Government as an economic consultant. He made a complete survey of the historical development of the Venezuelan petroleum industry which was published in the *Anuario Petroleo de Venezuela.*

Previously, Mr. Struth was assistant director of information for The American Petroleum Institute in New York, editor of *The Petroleum Data Book,* and for 11 years was identified with the Texas Mid-Continent Oil and Gas Association of Dallas, Texas as economist and administrative assistant to the executive vice president.

Mr. Struth is a member of The American Institute of Mining and Metallurgical Engineers, in which he has served three terms as chairman of economics, and also as a member of the executive committee. He has been prominently identified with various national petroleum industry committees, including the Statistical Advisory Committee of the American Petroleum Institute, secretary of the Economics Advisory Committee of The Interstate Oil Compact Commission, and also as a member of The Military Petroleum Advisory Board, U. S. Department of the Interior. During the NRA days, he was called to Washington to serve the government as technical advisor to The Petroleum Administrative Board, and later served as secretary and allocator of The Gulf Coast Refining Committee of the Planning and Coordination Committee.

To Enlarge Gasoline Plant

Continental Oil Co. will enlarge its Gillis natural gasoline plant near Lake Charles, La. at a cost of $1,500,000. Construction will start immediately, with completion scheduled for early in 1954. Contract for the construction has been let to Hudson Engineering Corp., Houston. The new facilities will increase the plant's processing capacity from 27 million to 90 million cubic feet of gas per day.

Depletion Allowance and Tomorrow's Oil

(Continued from page 62)

supply-demand relationship, we have at the moment substantial excess crude producibility and large stocks of products in storage. It is not going to be easy to maintain a sound long-range program, with the cyclical ups and downs which will always be with us. It will require a high order of intelligence and statesmanship to maintain access to foreign oil and at the same time have a healthy domestic industry, yet both must be preserved. There is every present indication that over the long pull, we must look forward to obtaining a gradually rising percentage of our own requirements from beyond our own borders. To forfeit our rights to that foreign oil in an effort to solve a temporary over-supply problem at home would be to jettison fuel at the start of a trans-oceanic flight against headwinds of unknown strength.

To the argument that the United States must be prepared to depend on oil within its own borders in wartime, the obvious answer is that in neither of the last two wars did we fight alone or could we have. Just as nations succeeded city states and principalities succeed tribes, so the world now seems to be coalescing into supranational units in which we must join or perish. It would be suicidal not to develop in peacetime the economic cooperation that has twice been found indispensable in war.

The most important factor of all in oil conservation is the right to do business as free men, risking our money as we see fit and taking the consequences as they come. Nowhere in the world has a government ever made a success of the oil business. That is no accident. Civil servants do not thrive on the unorthodox risks that are the life blood of a successful oil industry. The first great gusher in Texas was brought in by a man courageous enough to drill in an area which experts from both the United States Bureau of Mines and the Standard Oil Company had written off as unpromising. Russia, in half a century of czarist and communist regimentation, has slipped from being the world's largest oil producer to where she now produces less than a sixth as much as the United States and this despite the fact that there are greater sedimentary areas in Russia than in the United States.

These, then, are some of the more important roads to oil conservation: elimination of waste; improved methods of finding and producing oil; better refining techniques; more efficient engines; financial solvency for the oil industry; continued access to the reserves of the rest of the world; and the freedom of risk and take the consequences. If we can keep these roads open during the recurring winters of man's discontent, we shall never lack for oil.

Erratum

On Page 21 of the November issue of WORLD PETROLEUM was published an advertisement of Petroleos Mexicanos which purported to show the trend of oil operations in the Republic of Mexico prior to expropriation and since that time. Due to an unfortunate printer's error the red line indicating the date of expropriation was wrongly placed. In the current issue, the advertisement is reprinted with the red line correctly showing that private oil companies ceased operations in 1937 and Petroleos Mexicanos conducted the business in the year 1938 and thereafter.

Ellsworth Heads GSI Sales

Geophysical Service, Inc. has announced appointment of T. P. Ellsworth, formerly division manager of its west coast division, as sales manager in the GSI marketing department. He has moved from Bakersfield, Calif. to Dallas, where he will work from the general headquarters of GSI, 5900 Lemmon Avenue.

Mr. Ellsworth was a party chief with Western Geophysical Co. from 1936 to 1943. He was chief geophysicist with Richfield Oil Corp. from 1943 to 1951. In 1951 he joined the staff of Geophysical Service, Inc. as division manager on the west coast.

IN DIRTY, DUSTY WORKING CONDITIONS

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In the blinding desert dust storms which sweep the area of the Iraq pipelines, VOKES filters have twice been chosen for the important task of protecting pumping stations and ancillary equipment . . . proof indeed of the important part which VOKES filtration is playing throughout the world in safeguarding plant and machinery from wear, breakdown and unnecessary depreciation. In 30 years nothing has been found to improve upon the basic principles of VOKES filtration for such testing applications as these . . . and the fact that VOKES filter elements are *cleanable* avoids the possibility of the filter being put out of service in remote areas through element replacements not being available. Literature giving details of VOKES filters for all applications in industry will gladly be supplied on request.

ENGINE FILTRATION

VOKES filters for engine protection including lubricating oil filters—filtering all the oil all the time; fuel filters, protecting engines and injection equipment from damage through foreign matter in the fuel supply; engine air-intake filters which prevent the ingress of all particle sizes which would otherwise cause needless damage and depreciation.

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INTERNATIONAL NEWS AND NOTES

Italian Natural Gas Fair

The second Italian national meeting on natural gas utilization was held in Piacenza, Italy, from September 12 to 14 with 400 participants from Italy and foreign countries. Fourteen papers were presented and discussed dealing with economical and technical problems in Italy.

Natural gas produced in Italy during 1952 totaled 40 billion cubic feet, forecasts for the current year are for 66 billion, and for more than 80 billion in 1954. Of the distributed gas, 90.5 percent went to industries, 5.9 percent to domestic purposes, and 3.6 to motor fuel. Average sale prices, during the last 12 months, decreased about 35 percent.

Almost all industrial plants in North Italy (where a pipe line system 1,500 miles long has been laid) are at present supplied with natural gas, and in the future the main field of expansion is expected to be that of domestic and heating use. Distribution of gas in the intensely populated area of the Po Valley will permit substitution of gas for expensive and less plentiful fuels (brown coal, charcoal, wood).

Use of natural gas as a raw material for production of chemicals has been developed during the last three years. At present, the internal demand for methanol, chlorinated derivatives and hydrogen cyanide is satisfied by national synthetic production from natural gas, and a great share of fertilizers produced in Italy start from natural gas as a source of hydrogen for intermediate ammonia. Total consumption of natural gas for chemical purposes averages six billion cubic feet/year.

An exhibition of machinery, tools, apparatus, and various activities connected with the natural gas industry was held at Piacenza from September 12 to 27. About one hundred Italian and foreign firms participated in the exhibition.

Appoints Canadian Distributor

Eastman Oil Well Service Co. Ltd., Calgary, has been appointed exclusive distributors for all Wagner-Morehouse equipment in Canada. Eastman Oil Service Co. Ltd. also maintains warehouse and service facilities in Edmonton, Alberta; Dawson Creek, British Columbia; Regina, Saskatchewan; and Weyburn, Saskatchewan. Additional warehouse and service facilities will soon be available in Virden, Manitoba, and Swift Current, Saskatchewan. Wagner-Morehouse, Inc., specializes in the design and manufacture of complete mobile integrated drilling units and oil well servicing units.

Nahorkatiya No. 1 in the jungle of the Assam Valley.

International Drilling Company

Nederlandsche Boormattschappij N.V. (Netherlands Drilling Company), a joint enterprise of Dutch interests and Drilling and Exploration Company of Houston and Los Angeles, has been organized in Holland to engage in drilling on a world wide scale. Monty R. Garrison, formerly with the Petroleum Administration for Defense, will be managing director of the new company, and its operations will be under the supervision of J. H. Lewis, vice president of Drilling and Exploration in charge of foreign operations.

Under direction of J. E. Brantly, executive head of Drilling and Exploration until his retirement last year, the company carried on drilling in the principal oil fields of the United States and also in South America, Europe and the Middle East for individual oil companies and as representative of a number of governments. Announcement of its latest international development was made by Clarence A. Wiggins, president of the company, from his headquarters in Houston.

To Open Terminal At Dakar

Esso Afrique Occidentale S.A.F. has opened a new ship fueling station at Dakar, French West Africa. The marine installation, designed for high-speed delivery of fuels directly from shore tanks to ship bunkers, is being completed at a cost of about $700,000. Included in the project are storage tanks with capacities totaling 233,000 barrels for diesel fuel and bunker-grade residual oil burned by steamers.

Dakar, major French naval base and colonial seaport, is strategically located on the South and West Africa trade routes. Development of industrial and natural resources in these areas since the war has boosted demand for ship fuels at Dakar to more than seven million barrels a year.

Testing Assam Discovery

Assam Oil Co. is conducting tests on its wildcat discovery 18 miles southwest of the Digboi oil field in northeastern India. Preliminary tests indicate a discovery of consequence and the company is staking locations for step-out drilling operations.

The Nahorkatiya wildcat was drilled to a total depth of 11,715 feet, although production tests are being made at about 10,000 feet.

Encouraged by the Nahorkatiya showing, Assam Oil Co. has undertaken an intensive geophysical study of the Brahmaputra Valley. Seismic, gravity and aeromagnetic surveys will be made simultaneously in the most intensive program of oil exploration yet undertaken in India.

Covering more than five thousand square miles, the area to be surveyed extends from the Mishmi Hills in the northeastern extremity of Assam to the Mikir Hills in the southwest. In between is the flat alluvial plain of the Brahmaputra Valley, over which the Assam Oil Co. of Digboi has been granted the rights to search for oil.

The company will be using helicopters in the seismic survey and ordinary aircraft for the aeromagnetic survey. This will be the first time that helicopters have been employed in oil prospecting operations in Asia.

In the Digboi oilfield, of which the Nahorkatiya structure may prove to be an important extension, deep drilling operations are expanding and output from the producing wells is being stepped up.

Meanwhile, in the hope that further results will justify the cost, Nahorkatiya is to be linked with Digboi by a direct road through the jungle and the Upper Dihing reserved forest. This road, which will accommodate an oil pipe line for transporting Nahorkatiya crude to the Digboi refinery, will serve the new drilling locations on the Digboi side of the Burhi Dihing River, where there is no rail siding. It should be in operation in 1954.

Soviets Cease Exploration in Austrian Fields

This summer a Soviet Control Commission made a survey of all German asset enterprises in Austria. It reported that Soviet expenditures for exploration of Austrian fields were not justified by the return derived from the operation of producing fields.

The central office of the Soviet Oil Administration has, as a result, been moved to Schoenkirchen, a little village in the oil region, from its former extensive quarters in downtown Vienna. Only one representative is staying on in Vienna as a contact man.

Search for new fields has ceased entirely. Out of the 6,000 Austrian employees of the Soviet Mineral Oil Administration, some 1,500 have been released, as well as 60 men from among the 400 armed guards used at installations of the SMOA. Wildcatting at Rabensburg, near the Czech border, stopped about the middle of August. Certain drilling equipment has been dispatched eastward. Barbed wire encloses shutdown wells of small productive capacity.

Two Austrian companies have been producing crude under Soviet orders ever since the war's end, and have been selling their whole production, averaging 550 metric tons daily, at a fixed and extremely low price. The amount owing them is now in excess of $400,000. Now that the Soviets have guaranteed payment of their own costs for occupying Austria, they are cutting corners in many fields.

ISAP to Publish Bulletin

President Emilio Montane of the South American Institute of Petroleum has announced that the directors of the Institute have decided to publish a Bulletin of Information to be circulated among its members and associates. The publication will carry notices of general interest to members of the petroleum industry, along with abstracts from foreign journals and items relating to activities of the organization. The board has also decided to take over the Argentine section of the journal ISAP which will be devoted to illustrated technical articles.

First West Australian Well Spudded

Rough Range No. 1, first well to be drilled in an Australian oil concession area comprising some 350,000 square miles, was spudded in on September 5 by West Australian Petroleum Pty., Ltd. After more than two years of mapping and geological and geophysical exploration, analysis and planning, the Rough Range site was selected. Joint interest in West Australian Petroleum (WAPET) is held by both Australian and American interests—Ampol of Australia to the extent of 20 percent and Caltex associates 80 percent.

The dotted area shows the region to be covered by geophysical surveys being undertaken in the northeast corner of Assam as a result of Assam Oil Company's new discovery well at Nahorkatiya, near the southern edge of the plain. The well, drilled to 11,715 feet, appears to have made an important discovery at around 10,000 feet.

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British-Dutch Production

Oil production overseas by British and associated Dutch oil interests rose from 66 million tons in 1947 to 100 million last year, but to meet all their market commitments in recent years, they have had to purchase additional crude or refined oil from U.S. companies. This fact appears from a survey, by Petroleum Information Bureau, of what oil means to Britain. The Bureau recalls that in recent years British and associated Dutch companies have handled up to 50 percent of the world's oil trade (excluding the U.S.A. and U.S.S.R. controlled territory).

The biggest oil refining industry in Europe has been created in Britain since the war. This involved a capital outlay of over £150 million. One major oil company in Britain estimates that, in order to meet its U.K. commitments, it has had to invest the sum of approximately £10,000 for every single one of its employees.

Douglas Oil Enters Peru

Douglas Oil Co. of California has acquired operating rights on more than 1,000 acres of proven oil land in northern Peru, and arrangements have been made to launch an extensive drilling program in November. An agreement has been signed with Compania Petrolera Lobitos, a subsidiary of a British company, Lobitos Oilfields Ltd., covering all of Lobitos' continental shelf concessions in the Lobitos area. The property lies offshore and is contiguous to the presently producing Lobitos oil field. There are at least five producing zones in the Lobitos on-shore area, at depths ranging from 1,100 to 7,500 feet.

Douglas has also acquired an option from Empressa Petrolera Fiscal covering 20 miles of coast line from Cabo Blanco north to Mancora, Peru. Geological survey is now in process and a wildcat well is contemplated as soon as the survey is completed. The property will be operated by Douglas under a joint venture agreement in which Douglas has a two-thirds interest, with several prominent California oil men having the remaining one-third interest.

Methane Fair in Italy

During the second and third weeks of September the Chamber of Commerce, Industry and Agriculture of Piacenza held its second annual "Methane Fair." The first Fair, held last year, proved very successful, with many national and foreign companies exhibiting their equipment. During the first three days of the exhibition this year, a meeting of technical men was held for discussion of problems posed by Italy's expanding natural gas industry.

Appointed by Saskatchewan Department of Mineral Resources

A. D. Cumming has been appointed research petroleum geologist with the Petroleum and Natural Gas Branch of the Saskatchewan Department of Mineral Resources. Mr. Cumming will be carrying out research at the geological survey laboratory in Regina. His appointment took effect October 21.

Qatar Crude Analysis

In the July issue of WORLD PETROLEUM, in an article dealing with development of the oil industry in Qatar, an analysis of Qatar crude was given based on an article in the 1950 volume of "*The Science of Petroleum*." Attention of the editors has been called to the fact that current crude production differs in character from that produced at the time the original analysis was given in 1950.

Present gravity is 40.4 API. Sulfur content is 1.26 wt. percent. Yields of principal products are as follows: gasoline 26.5 percent, kerosine 17.5 percent, gas oil 20.5 percent, residue 33.5 percent, gas and loss 2 percent. Motor octane number of the unrefined gasoline fraction is 53 and the diesel index of the gas oil fraction is 59. Aromatics content of the gasoline is 10.4 wt. percent and of the kerosine 23.4 percent.

Yields of kerosine and gas oil are higher than in the early history of the field, while yields of gasoline and residual oils are lower. The sulfur content is also lower.

Cousteau to Conduct Geological Research for Anglo-Iranian

Captain Jacques-Yves Cousteau, the world's leading marine archeologist, has agreed to conduct underwater geological research for the Anglo-Iranian Oil Company in a new concession off the Arabian coast of the Persian Gulf, the company has announced.

A member of the Paris Institute Campagnes Oceanographiques and author of "The Silent World," a best-seller recounting his diving experiences, Captain Cousteau plans to leave France next month in his ship "Calypso" for a several months' trip to the Indian Ocean and the Persian Gulf.

Captain Cousteau's researches into seabed geology "will prove a valuable aid to normal prospecting methods," the company stated.

The area to be explored for Anglo-Iranian is in a concession acquired from the ruler of Abu Dhabi last March by its wholly-owned subsidiary, the D'Arcy Exploration Company. Formerly held by Superior Oil Company of California, the concession area exceeds 12,000 square miles of continental shelf.

The term of the concession is 65 years and covers rights to produce, export and refine oil. D'Arcy has an obligation, however, to begin exploration within one year of signature of the agreement and to drill within five years of signature if a suitable location can be found.

New Wage Contract

Oil companies operating in Venezuela have signed a new wage contract which was negotiated under auspices of the Ministry of Labor. Minimum daily wage was increased from $4.80 to $5.475 per day. Salaried workers will enjoy an increase of 10 percent together with certain fringe benefits including longer vacations for employees with long-time service records. Other benefits include medical assistance and housing allowances. Estimates are that the new three-year contract will increase operating costs of the oil companies by about $7,500,000 per year.

BOOKS

PRACTICAL ACCOUNTING FOR OIL PRODUCERS—Robert William Pritcher	$ 9.50
ALKYLATION OF ALKANES—Gustav Egloff & George Hulla	$22.50
CORROSION HANDBOOK—Herbert H. Uhlig	$12.00
CHEMISTRY OF PETROLEUM DERIVATIVES—Carleton Ellis Vol. I	$20.00
Vol. II	$22.50
CONVERSION OF PETROLEUM—A. N. Sachanen	$12.00
CHEMICAL ENGINEERS' HANDBOOK—John H. Perry (revised 3rd edition 1950)	$17.00
CORROSION (Causes and Preventions)—Frank N. Speller	$11.00
THE CHEMICAL PROCESS INDUSTRIES—R. N. Shreve	$ 9.00
CHEMICAL ENGINEERING ECONOMICS—C. Tyler	$ 5.00
CHEMICAL ENGINEERING PLANT DESIGN—F. Vibrandt	$ 7.50
CHEMICAL TECHNOLOGY OF PETROLEUM—Cruse and Stevens	$ 9.50
DISRUPTED STRATA—M. H. Haddock	$ 4.25
DISTILLATION—Interscience Publishers, Inc.	$14.00
ELEMENTS OF FRACTIONAL DISTILLATION—Robinson & Gilliland (4th Edition)	$ 7.50
EMULSIONS & FOAMS—Berkman & Egloff	$12.00
ELECTRICAL ENGINEERING—E. E. Kemberley	$ 5.25
THE FISCHER TROPSCH AND RELATED SYNTHESES—H. H. Storch, N. Golumbic and R. B. Anderson	$ 9.00
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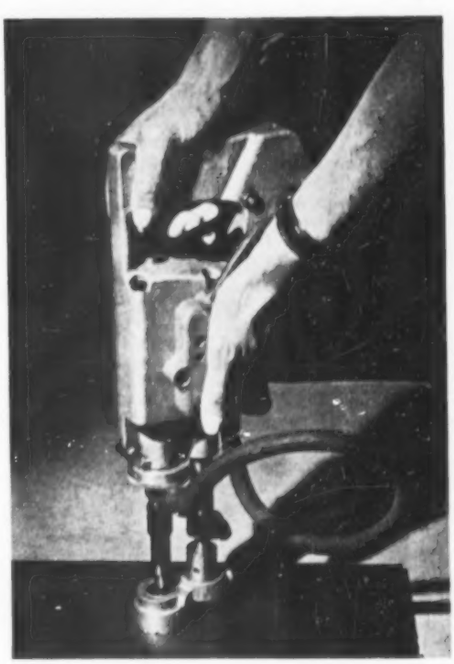

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OIL COMPANY STAFF CHANGES

ROBERT E. KEPKE has been appointed executive vice president of the British-American Oil Producing Co., with headquarters in Dallas, Texas. He succeeds C. D. Miller, resigned. Mr. Kepke will continue as vice president and director of the Toronto Pipe Line Co. and director of the Platte Pipe Line Co.

Mr. Kepke was called to Toronto in January 1949 to become vice president in charge of the newly created department of supply and transportation. He had served the producing company since 1942 in various capacities, including those of counsel, assistant to the executive vice president, and vice president.

R. C. BROWN of Calgary has been elected president of Hudsons Bay Oil and Gas Co. Ltd., Canadian affiliate of Continental Oil Co. Mr. Brown, who has been general manager of the company, succeeds L. F. McCollum, president of Continental, who becomes chairman of the board. The change is in line with the policy of having a Canadian in charge of operations in the Dominion.

HENRY C. AKERBERG, former Ring-Free Oil Division sales manager of the Macmillan Petroleum Corp., has been named vice-president in charge of all lubricating oil sales. He is succeeded by Robert Dunn, former east coast manager. In addition to his duties as export manager, O. H. Mueller, Jr. has been appointed vice-president in charge of merchandising and advertising.

HENRY E. WINTER has been appointed manager of the western division of Creole Petroleum Corp. He transferred from acting superintendent of the eastern division at Quiriquire. Mr. Winter joined Lago Oil and Transport Co. Ltd. at Aruba, N.W.I., in 1935 and transferred to Standard of Venezuela at Caracas in 1932. He was head of Creole's economics department in 1952 when he went to Quiriquire as acting assistant district superintendent.

CLARENCE L. MOODY, formerly staff research geologist, Shreveport, La., retired from The Ohio Oil Co. on October 31 after completing more than 35 years of service.

After two years' practice as consulting geologist in California and Wyoming, he joined Ohio Oil at Casper, Wyo. in 1918. Following various assignments, he advanced in 1921 to Shreveport division geologist. In 1950 he was promoted to the chief geologist's staff

P. M. JOHNS, JR., has been elected president of Noble Drilling Corp., Tulsa. He succeeds C. C. Forbes, who was elected chairman. Mr. Forbes has been executive head of the company since the retirement in 1948 of the late Lloyd Noble.

C. C. HARTER has been elected vice president of Oil and Gas Property Management, Inc., Dallas. Mr. Harter was employed by Continental Oil Co., DeGolyer and MacNaughton and San Juan Oil Co. prior to his new affiliation.

KERRYN KING has been appointed public relations director of The Texas Company effective November 1. Mr. King formerly was senior vice president of Hill and Knowlton, Inc., public relations counsel for Texaco.

During the past 10 years, Mr. King has supervised public relations activities for various clients of the firm, including leading corporations in the fields of aviation, automobiles, appliances, farm equipment and industrial products, including oil well drilling equipment and supplies. He also has served as secretary and a director of Hill and Knowlton, Inc.

R. E. Kepke

H. E. Winter

Kerryn King

L. W. MOORE has been elected first vice president of Pan American Petroleum & Transport Company. He will continue in his present position as president of Pan American Refining Corp. and Mexican Petroleum Corp. of Georgia. Mr. Moore will also continue as a director of the two last named companies as well as Pan American Gas Co. and Pan American Production Co.

Dr. Harold R. Snow, in addition to his position as vice president of Pan American Refining Corp. and Mexican Petroleum Corp. of Georgia, was made general manager of manufacturing on November 1. His offices will be in New York City. Dr. Snow has been general manager of Pan American's largest refinery at Texas City, Texas.

S. B. Schapiro, previously general superintendent of the Texas City plant, was appointed manager of engineering, construction and maintenance for Pan American Refining Corp. He will be in charge of these activities in the company's refineries located in Texas City, Texas; Savannah, Georgia; Baltimore, Maryland; and the one now in design stage which is to be built at Goodwin Neck near Yorktown, Virginia. He will have his headquarters in New York.

Paul F. Miller, now assistant general superintendent at Texas City, will become manager of industrial relations for all four refineries effective January 1, 1954, with headquarters in New York.

B. G. Babin, formerly assistant general superintendent at Texas City, was appointed plant manager, and W. S. Peeler, previously operating superintendent, is appointed general superintendent, both effective November 1. At the same time, M. C. Hopkins, formerly technical director, research and development department at Texas City, was appointed plant manager of the new refinery at Yorktown.

H. A. METZGER will join the Creole Petroleum Corp. on March 1, 1954 to assume charge of the New York office. Mr. Metzger will replace C. L. Burrill, vice president and director, who will resign on March 1, 1954 to become head of the general economics department of Standard Oil Co. (N.J.).

A graduate of Cornell University in 1921, Mr. Metzger's entire career has been in South America where he has held various positions in affiliates of Standard Oil Co. (N.J.), particularly in Colombia, Bolivia and Argentina. Since 1944 he has been president and general manager of the company's Argentine affiliate.

GEORGE W. MARSHALL, JR., division geologist for Continental Oil Co. at Roswell, N. M., has been promoted to the newly created position of assistant regional geologist for the southwestern area, with headquarters at Forth Worth. He is succeeded by G. H. Galny, assistant to the southwestern regional geologist at Fort Worth. J. B. Brown, geologist at Fort Worth, succeeds Mr. Galny.

THOMAS P. PIKE, California oil well drilling contractor, has been appointed deputy director of the Defense Department's newly created agency to coordinate supply and logistics for the armed services. Mr. Pike is president of Thomas P. Pike Drilling Co., Los Angeles, one of the largest independent oilwell drilling firms in California.

JACK C. AMES has been appointed marketing manager for Royalite Oil Co. Ltd. Prior to joining Royalite, Mr. Ames spent 15 years with McColl-Frontenac Oil Co. Ltd. in marketing and management activities. Since 1947 he has been Vancouver and district zone manager for that company. Before joining McColl-Frontenac, he worked for six years with Home Oil Distributors Ltd. in Vancouver.

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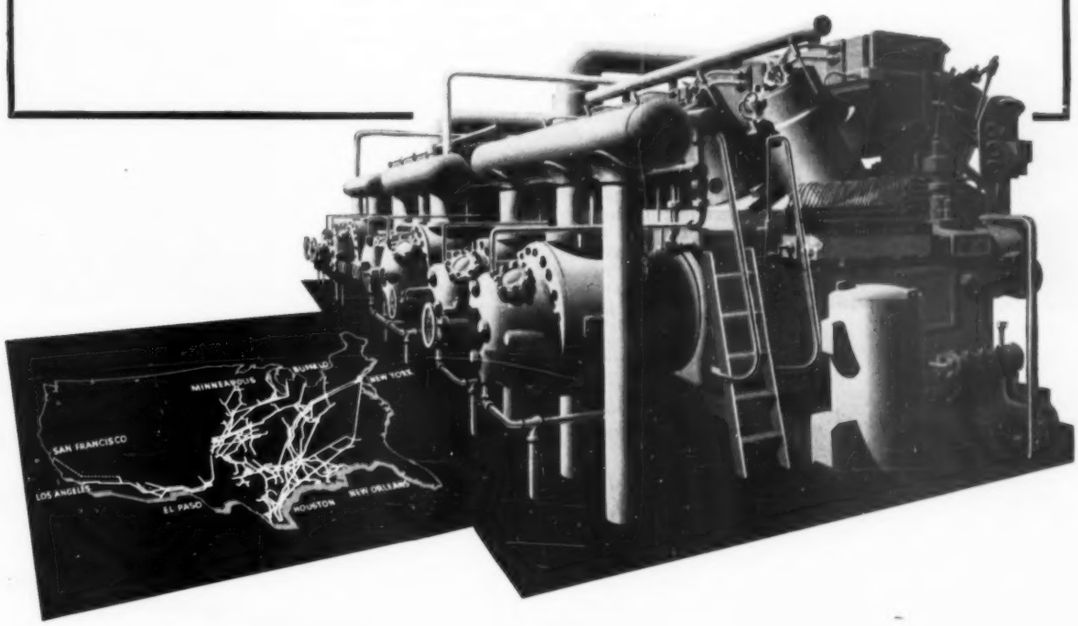
helps prevent operating troubles



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Operators of the many units lubricated with Gulf Security Oil report that this quality lubricant helps them get more operating hours between overhauls, and avoid unscheduled shutdowns.

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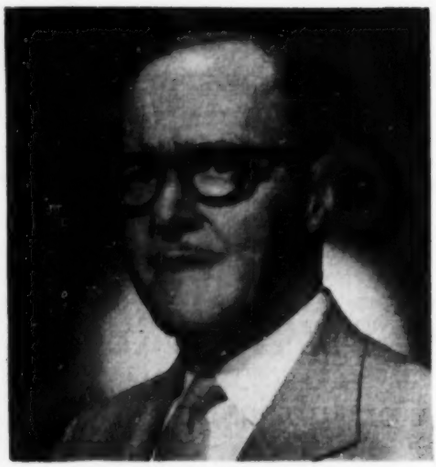
GULF INDUSTRIAL LUBRICATION

D. MILLER has resigned as executive vice president of The British-American Oil Producing Co. and vice president of The Toronto Pipe Line Co. He became vice president and general manager of the Harper and Turner Oil Co. on November 1. He will continue to be located in Dallas, where Harper and Turner are opening offices.

DAVID T. JENSEN has been named eastern division export sales manager of the Tide Water Associated Oil Co. He is a veteran with more than 30 years' experience in oil exports, having joined the New York office in 1920. In 1927 he was made supervisor of the South American section. One year later he was sent to Rio de Janeiro and advanced to the position of assistant to the manager of the company's offices there. Later he was transferred to Sao Paulo.

In 1930 he returned to New York, where he was made marketing assistant export sales manager, and in 1950, became acting export sales manager, which position he held until his recent promotion.

D. T. Jensen



Dr. D. M. Morrison

DR. D. M. MORRISON has been elected vice president in charge of manufacturing of Shell Oil Co. of Canada Ltd. He will continue his headquarters at the company's head office in Toronto and direct Shell's Canadian operations.

Dr. Morrison has a record of more than 25 years' service with Shell, during which time he held important posts in the firm's manufacturing department. During World War II he served with the Department of Munitions and Supply, and for his work was awarded the M.B.E. In 1952 he was appointed director of the petroleum division, Department of Defense Production, and held this position till his return to Shell as manager of manufacturing early this year.

Born in Nova Scotia, Dr. Morrison attended the University of British Columbia, McGill University, and obtained his Ph.D. from Cambridge University in 1927.

CHARLES F. SCOTT, treasurer for the past three years of Standard-Vacuum Petroleum Maatschappij, Indonesian producing and refining subsidiary of Standard-Vacuum Oil Co., has been named an assistant treasurer of the parent company in New York.

Mr. Scott joined Standard-Vacuum in 1939 and was assigned as an assistant accountant with the company's marketing organization in China. He was serving at Shanghai in 1941 when interned there at the start of the war. Repatriated on the Gripsholm late in 1943, he returned to Chungking, China, as an assistant naval attache.

Upon his discharge in 1946 from the U. S. Navy, Mr. Scott returned to company service at Shanghai as assistant finance and accounting manager. He went to Djakarta in 1947 as director in charge of financial affairs for Stanvac's Indonesian marketing subsidiary, and became treasurer of the producing and refining organization, also with headquarters at Djakarta, in November 1950.

C. F. Scott

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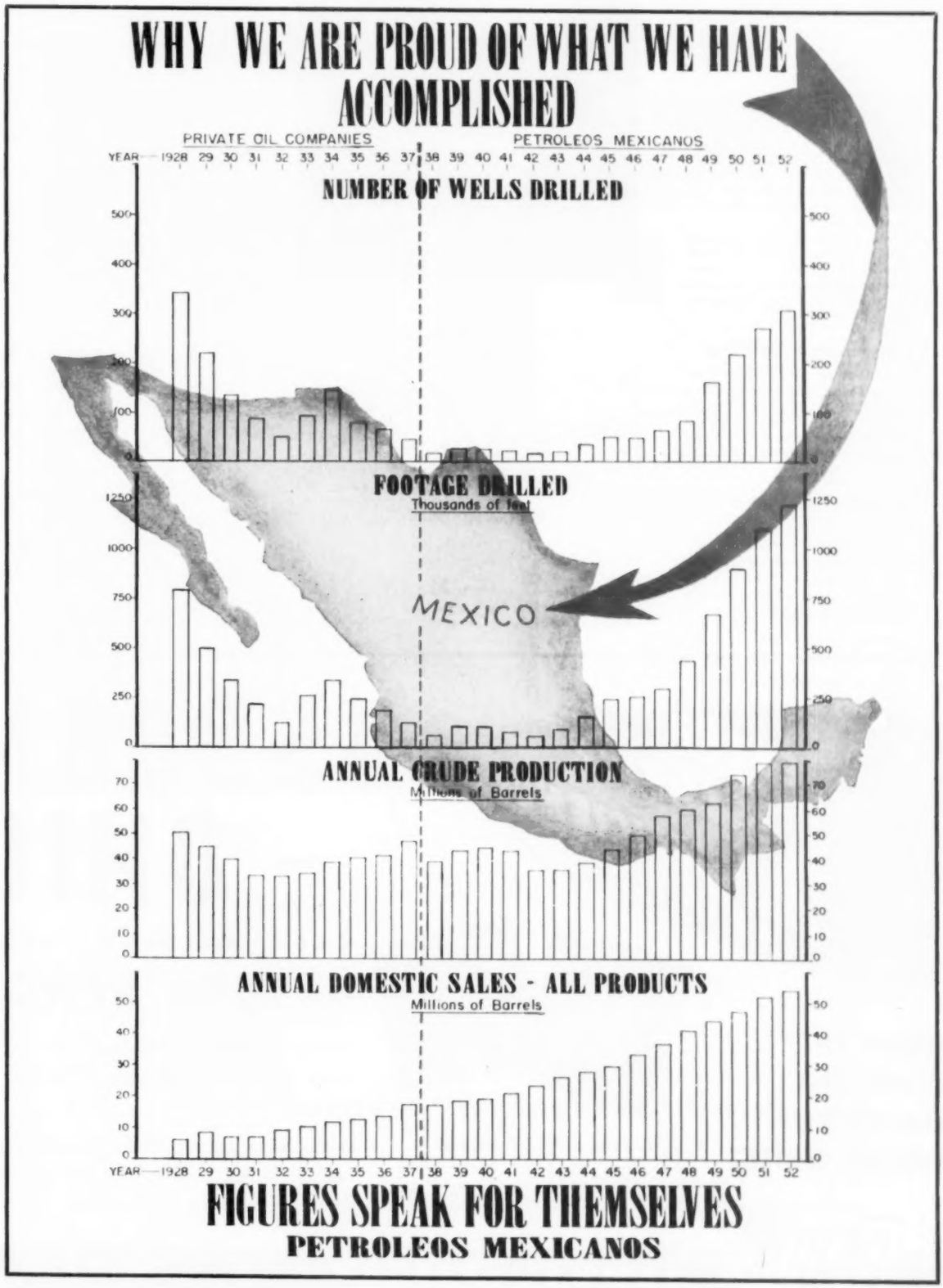
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ANNUAL CRUDE PRODUCTION
Millions of Barrels
ANNUAL DOMESTIC SALES - ALL PRODUCTS
Millions of Barrels
FIGURES SPEAK FOR THEMSELVES
PETROLEOS MEXICANOS

Donnell Awarded Gold Medal

Otto D. Donnell, former president of Ohio Oil Co., was presented with the API gold medal award for distinguished achievement at the annual meeting of the Institute at Chicago. In accepting the award, Mr. Donnell predicted an expanding future for the petroleum industry. He expressed pleasure that the industry is showing more interest in human relations and that the present generation has a grand opportunity to add excellent public relations to the industry's recognized technical proficiency.

Mr. Donnell is one of the charter members of the American Petroleum Institute. Now 70, he served as chairman of the production committee for the general committee for District II for the petroleum industry war committees throughout World War II. He later was chairman of the general committee which was charged with integration and operation of the petroleum industry in 15 mid-western states.

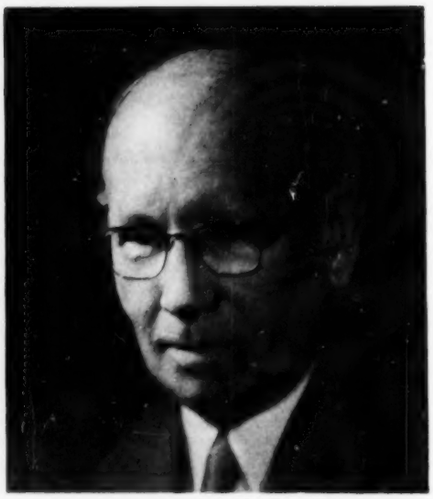
He began his career as a mechanical engineer with Ohio Oil in 1906. He was elected to Ohio's board of directors in 1910, became a vice president in 1913, and succeeded his father as president in 1927. He retired from the presidency in 1948.

Named VP by Falcon Drilling

Jerald L. Strauss, Tulsa, has been named vice-president in charge of Falcon Seaboard Drilling Company's operations in the Rocky Mountain area. He will continue as vice-president of the Mid-Continent area and treasurer of the company. Mr. Strauss has been with Falcon Seaboard since it was organized in 1935.

Gas-Filled Induction Motor

The world's largest totally-enclosed gas-filled induction motor was installed recently at the Esso Standard Oil Company's refinery at Everett, Mass. Built by General Electric Company, the 14-ton giant is rated at 3,000 hp, 1,800 rpm, 2,300 volt, 3 phase, and is used to power a centrifugal compressor.



O. D. Donnell

Fleet Maintenance Training

A national program of college training in fleet maintenance management directed by the National Advisory Committee for Motor Fleet Supervisor Training has been announced by Prof. Amos E. Neyhart, national secretary of the group, and J. N. Bauman, vice-president of The White Motor Co. The program is financed by The White Motor Company. The courses will be offered at colleges throughout the country starting in January 1954.

Reed Roller Bit Retirements

Three Reed Roller Bit Co. veterans, each with a long career in the oil tool industry, retired from active service on November 1. They are salesmen John H. Tear of Houston and Frank C. Sergeant of Corpus Christi, Texas and John C. Stokes, development engineer at Houston headquarters.

Hot Underground Pipe Insulator

A revolutionary new petroleum product for insulating and protecting hot underground pipes from corrosion has been announced by American Gilsonite Co., Salt Lake City, Utah, jointly owned by the Barber Oil Corp. and Standard Oil Co. of California.

The new product, known as Gilsulate, provides a triple zone of protection for the hot underground pipes against such commonly-encountered corrosive factors as alkaline ground waters, electrolysis, root attacks, and bacterial action. It is a blend of specially sized and selected Gilsonite, a unique, solidified petroleum found only in the Uinta Basin of Eastern Utah. When poured around a hot underground pipe, a layer of Gilsulate melts and is fused to the pipe. Outside this first layer or zone, there is a zone of sintered Gilsulate particles. Both are waterproof. Finally, there is a third zone of unconsolidated Gilsulate which provides thermal insulation.

Gilsulate is simple and easy to install without the use of skilled labor. Because of its high insulating efficiency, hot and cold lines may be buried in the same ditch. It is supplied in three grades to meet temperature needs ranging from 220° F. to 520° F.

New Products Line to Washington

Continental Oil Co. and associates soon will begin construction of a 537-mile products line from Billings, Mont., to Spokane, Wash. which will cost $20.5 million. The 10-inch line will have an initial capacity of 30,000 b/d. Terminals will be built at Bozeman, Helena, Missoula and Spokane.

Continental Pipe Line Co. will direct construction of the line and will manage its operations through the staff of the newly formed Yellowstone Pipe Line Co. Continental Oil and Interstate Oil Pipe Line Co., an affiliate of Standard Oil Co. (N.J.), each own a 40 percent interest in the Yellowstone line. Union Oil Co. of California has a 14 percent interest and the H. Earl Clack interests six percent.

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Standard Welding 180° U Bend with extra heavy outer wall to ensure longer life.
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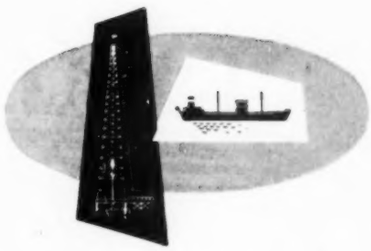
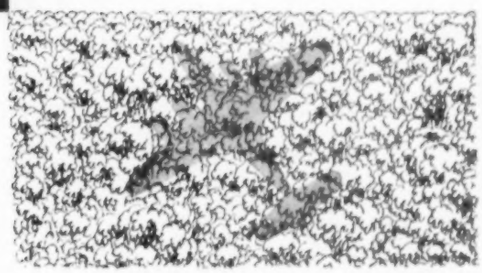
STANDARD-VACUUM

When night steals over the paddy fields of Java, kerosene burns in the farmers' lamps to drive the darkness away • When an airliner sets down in Bangkok, hundreds of gallons of high octane aviation fuel pour into the tanks which feed its powerful motors • A road reaches into the back country of Luzon; asphalt from oil gives it a hard, smooth surface • And when a tramp steamer sails from Mombasa, bunker oil may turn the screws as they churn the waters of the Indian Ocean.

From Tokyo to Karachi; from the minerally rich highlands of Southern Africa to the coastal cities of Australia and New Zealand, the varied petroleum products of Standard-Vacuum weave in some way through the whole pattern of living.





STANDARD-VACUUM OIL COMPANY

A name that stands for "Progress" in the East

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SOUTH PACIFIC ISLANDS • SOUTH WEST AFRICA • TANGANYIKA • THAILAND • UNION OF SOUTH AFRICA

Oil-Immersed Starters

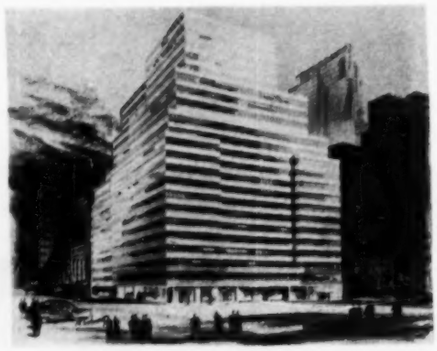
The G-E line of oil-immersed motor starters, with special emphasis on design and maintenance, is described in a new publication GEA-3541, announced as available from the General Electric Co., Schenectady 5, New York.

Appoints European Representative

Scientific Design Company, Inc. has announced the appointment of Dr. Philip Edward Newman as European representative. Prior to this appointment, Dr. Newman was chief chemical engineer and project manager for the Pechiney Co. of France. During his service with the U. S. Army, he was a Captain in the Corps of Engineers and operations officer in the Military Government Control of the German chemical industry.

Before entering the Army, Dr. Newman was engaged in research at the Mellon Institute. He also served with the Hercules Powder Co. as chemical engineer in production and plant operation problems.

Dr. P. E. Newman



New Caltex Offices

California Texas Oil Company Ltd. has moved to new quarters at 380 Madison Avenue, where the eighth to 13th floors have been leased. The move has brought the varied activities of Caltex together from five different buildings which formerly housed the 1,225 employees.

Operations of the Caltex Group are all overseas, in more than 60 countries of the Eastern Hemisphere. Expansion over the post war period has been highlighted by new construction or expansion of oil refineries in Bahrain, France, Holland, Italy, Japan, the Philippines, Australia and Lebanon. Other construction by the Caltex Group is contemplated in India and the Group is associated with refining operations in Spain.

In Western Australia a Caltex affiliate and its Australian partner, Ampol Petroleum Ltd., have formed West Australian Petroleum Ltd. and have just begun drilling the first well in an area of 350,000 square miles of a semi-desert area.

Testing Instruments Guide

A buyer's guide on electric testing instruments has been announced as available from the General Electric Co., Schenectady 5, New York. The new 16-page bulletin, designated GEA-5469B, provides application data, features of each instrument, and prices.

Suntide's Corpus Christi Plant Nears Completion

Suntide Refining Co. has fired up its crude stills for the production of gas oil at its nearly completed catalytic cracking refinery at Corpus Christi, Texas, and is running ahead of schedule in completion of principal oil processing units. The gas oil stock is being accumulated for catalytic cracking stock.

Appointed by Exploration Surveys

W. Paige Ballard has been appointed divisional sales representative for the Texas-Louisiana area of Exploration Surveys, Inc., of Dallas. During World War II, Mr. Ballard served as officer in charge of all engineering at the world's largest air depot in Oklahoma City, as well as serving as test pilot for combat aircraft at that time. After the war he served in the production engineering section of the Atlantic Refining Company's producing offices in Dallas, where he helped to pioneer more efficient recovery techniques and cementing operations.

W. P. Ballard

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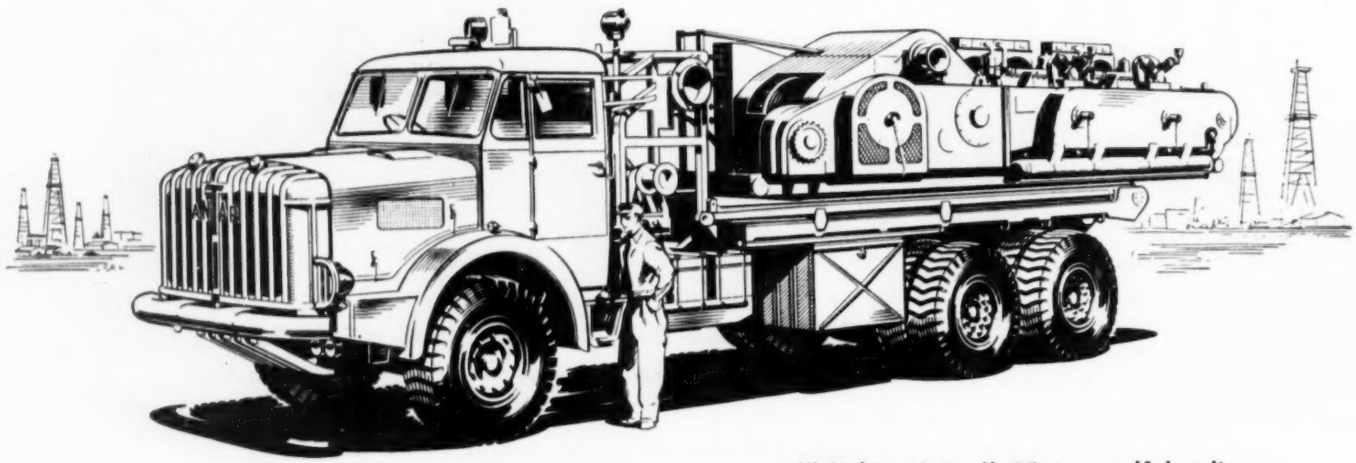
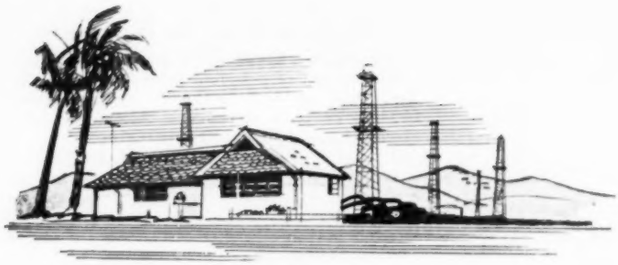


"Mighty Antar" 25 ton self loading oilfield truck. One of several shipped to Sarawak and Venezuela for Shell.

JOHN I. THORNYCROFT & CO., LIMITED, THORNYCROFT HOUSE, SMITH SQUARE, LONDON S.W.I., ENGLAND.



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Men and women serving in remote sites or trying climates deserve every home comfort you can give them. Above all, they deserve the heartening comfort of Dunlopillo with its deep, buoyant ease which years of hard use cannot diminish. Hard climates, indeed, demand Dunlopillo, which is unaffected by climatic variations. Air circulates through its cellular structure at every movement to keep the material 'air-conditioned' in extremes of heat and cold.

Dunlopillo is completely hygienic in all conditions. It cannot create dust or fluff. It can never sag, form lumps or otherwise lose its perfect shape. Dunlopillo is a great work-saver, too, for it never needs turning, or airing. From all aspects of comfort, hygiene, economy and convenience Dunlopillo is by far the wisest choice. Dunlopillo comfort is available in mattresses, cushioning, pillows, bolsters, carpet underlay and stair pads.

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GOTHENBURG	SWEDEN	NEW YORK	U.S.A.	WELLINGTON	NEW ZEALAND
HAMBURG	GERMANY	RIO DE JANEIRO	BRAZIL		

Furfuryl Alcohol

A new booklet devoted to furfuryl alcohol has been published by the chemicals department of the Quaker Oats Co. The 28-page booklet contains information on commercial handling, physical data, chemical reactions and established uses of furfuryl alcohol. It is the first printed booklet devoted solely to furfuryl alcohol.

New Hammond Iron Works Plant

Hammond Iron Works has completed a fabricating plant on the outskirts of Birmingham, Ala., to produce the full line of Hammond products for the oil industry of the southeast and central southwest states. Products include field erected storage tanks, elevated water tanks and standpipes, and all general types of steel plate construction.

Oil Company Earnings Higher

Net earnings of 48 oil companies in the first nine months of 1953 totaled $1,672,957,000 as compared with $1,542,204,000 in the first three quarters of 1952. The increase in profit was 8.6 percent.

Of the 48 companies for which reports are at hand, 37 reported higher earnings and 11 lower earnings. Only one reported a deficit for the period. Details are given in the following tabulation:

NINE MONTHS' EARNINGS

	Net Income (Thousands of Dollars)		Per Share of Common	
	1953	1952	1953	1952
Amerada	$ 12,962	$ 9,373	$4.10	$2.98
Anderson Prichard	3,368	3,176	4.14	3.90
Atlantic Refining	33,011	31,149	3.58	3.37
Barber Oil	3,552	1,638	4.70	2.17
Bishop Oil	1,021	923	.77	.37
Chicago Corp.	3,785	3,321	1.08	.93
Cities Service	37,715	36,591	9.70	9.41
Continental Oil	31,163	27,995	3.20	2.88
Deep Rock	1,024	407	2.28	.91
Derby Oil	961	704	2.07	1.52
Gulf Oil	116,828	97,802	4.95	4.15
Honolulu Oil Co. Ltd.	7,486	5,425	3.99	2.89
Houston Oil Co. Texas	5,002	4,389	3.77	3.33
Imperial Oil	35,323	31,415	1.18	1.05
Inter. Petroleum Co. Ltd.	18,135	22,300	1.25	1.54
Lion Oil	7,450	7,528	2.41	2.44
Louisiana Land & Exp.	8,017	5,936	2.69	1.99
Maracaibo Oil Explor.	324	243	.65	.49
Mid-Continent	10,626	11,739	5.72	6.32
Middle States	1,901	1,624	.85	.73
Pacific Western	8,969	6,376	1.72	1.32
Panhandle	664	694	.42	.43
Phillips	55,458	56,292	3.80	3.87
Plymouth Oil	6,744	7,151	—	—
Portepec Oil	1,806	1,760	.60	.40
Pure Oil	18,518	20,195	4.14	4.56
Ohio Oil	33,025	30,426	5.03	4.64
Quaker State Oil Ref.	1,534	1,334	1.66	1.41
Richfield	19,359	17,993	4.84	4.50
Seaboard Oil Co. (Del)	4,622	3,750	3.79	3.07
Shell Oil	81,481	62,657	6.05	4.65
Sinclair Oil	47,506	54,456	3.87	4.45
Skelly Oil	22,600	19,856	3.93	3.45
Socony Vacuum	133,000	169,000	3.80	3.80
Std. Oil Co. (Calif.)	140,217	130,364	4.89	4.55
Std. Oil Co. (Ind.)	88,634	86,794	5.76	5.65
Std. Oil Co. (Ken.)	7,764	7,229	2.98	2.78
Std. Oil Co. (N. J.)	415,000	391,000	6.85	6.45
Std. Oil Co. (Ohio)	14,198	12,668	3.38	3.00
Sunray Oil	20,038	18,572	1.84	1.73
Swan Finch	d1,883	d2,607	—	—
Tide Water Assoc.	16,122	14,232	3.42	3.01
The Texas Company	133,353	130,290	4.85	4.74
Texas Gulf Producing	2,911	2,385	2.63	2.15
Union Oil Co. of Calif.	28,007	19,494	4.72	3.25
Universal Consolidated Oil Co.	28,007	19,494	5.19	3.57
Venezuela Petroleum	2,799	1,815	.70	.45
Warren Petroleum	2,142	2,295	1.26	1.35
Wilcox Petroleum	708	561	2.52	2.00
TOTAL	$1,672,957	$1,542,204		

d—Deficit

Products Line to Wisconsin

Construction by Badger Pipe Line Co. of a $15 million products pipe line from Chicago to Madison, Wis., to start in the spring has been announced by C. S. Mitchell of Bartlesville, Okla., president of Cities Service Pipe Line Co., and of the recently-incorporated Badger Pipe Line Co. The 215-mile system, which will give Wisconsin its first petroleum products pipe line, will be built and operated by Cities Service Oil Co., Sinclair Pipe Line Co., The Pure Oil Co., and The Texas Co. Capacity will be 65,000 b/d.

Refinery Process Burner

Peabody Engineering Corp. has published bulletin 703-A covering combination gas and oil burners and vertically or horizontally fired premix gas burners for process furnaces. The bulletin may be obtained from Peabody Engineering Corporation, 580 Fifth Avenue, New York 36, N. Y.

Harry Jennings Crawford

Harry Jennings Crawford, 86, director and chairman of Quaker State Oil Refining Corp., died November 3, 1953. Mr. Crawford was a pioneer in Venango County's oil industry, a financier, industrial leader and philanthropist. He was director of Columbia Gas and Electric Corp., New York; Manufacturers Light and Heat Co., Pittsburgh; Pennsylvania Fuel and Supply Co., Emlenton; Mountain Fuel Supply Co.; Devonian Oil Co.; and Reno Oil Co. He was an organizer and director of the Talon Fastener Co. and a director of the Lone Star Gas Co.

Frederick Henle

Frederick S. Henle, president and founder in 1916 of S. Henle, Inc., oil exporters, died at his home in New York City. He was widely known in export circles and was a member of the advisory committee of the Office of International Trade of the U. S. Department of Commerce.

Descale WITHOUT Danger

The Air Motor "Skatoskalo" Set enables the operators to descale and clean tubes in the shortest possible time with the greatest efficiency. The air motor gives more horse-power and does not stall when heavy deposit is encountered.

The Air Motor Driven Set incorporates all the advantages of a Rotary Air Tool without sacrificing the advantages of the electrically-driven Flexible Drive type.

"Skatoskalo" equipment can be used with complete safety and is recommended for the efficient maintenance of cracking plant, boilers, evaporators, condensers, heat exchangers, etc.

Tubes of 5/8" internal dia. upwards can be thoroughly cleaned by "Skatoskalo" Air Tools.

Skatoskalo pneumatic tools deliver 9,000 blows a minute. Other types for surface scaling.

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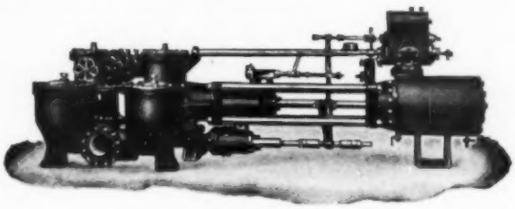

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"Hall" Horizontal Duplex and Horizontal Simplex type pumps are manufactured for almost every refinery service. Pumps can be supplied with steam jackets, elongated water cooled stuffing boxes, special type valves and seats etc. If required they can be fitted with proportioning pumps. Pump ends and internal fittings are of special materials according to the nature of the liquids to be handled. Modifications to suit any individual layout are incorporated as required.

PUMPS FOR HANDLING OIL IN BULK

For handling oil in bulk, "Hall" Horizontal Duplex and Horizontal Compound Duplex type pumps have a proven record of reliability and efficiency, with maximum economy in operation. The "Hall" Compound Duplex pump is specially designed to give minimum steam consumption.

HALL PUMPS

"Hall" pumps of every type are backed by an efficient and comprehensive record system ensuring the correct and prompt supply of spares and replacements.

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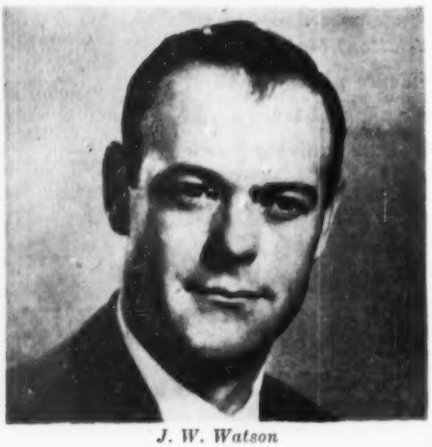

J. W. Watson

Named Assistant Controller for National Supply

Appointment of Gordon R. Graham as assistant controller has been announced by the National Supply Co., Pittsburgh. Mr. Graham joined National Supply in 1945, and became controller of the company's Spang-Chalfant Division plant at Etna, Pa., in 1946. He was appointed general auditor in 1949 and in 1952 became administrative assistant to the vice president and controller. In his new position, Mr. Graham will have prime responsibility for plant and sales accounting.

New Shell Film on Fossils

"The Fossil Story" is the newest film to be released by Shell Oil Co. for free showing to interested groups. Photographed in full color, the 16mm. sound motion picture shows how men in industries such as oil utilize vestiges of prehistoric life in their work. The new motion picture depicts the three basic fossil forms: actual bones, petrified remains of animal and plant life, and the impressions left in stone.

A great range in size of fossils is pictured, from huge dinosaurs and mastodons re-created in museums to the diatom. "The Fossil Story" runs 19 minutes. Like other films in Shell's movie library, it is available free upon written request to the Shell Film Library, Room 4226, 50 West 50th Street, New York 20, and 100 Bush Street, San Francisco, California.

Open New Sales Office

McCullough Tool Company recently opened a new sales office at 1334 Fidelity Union Bank Building Dallas, Texas. The new office, in charge of John W. Watson, will service the oil industry in the Dallas-Fort Worth area. The opening of this new office gives the McCullough Tool Co. a total of 31 locations in the eastern division. Mr. Watson joined McCullough in 1951. Prior to that time he had been with Gulf Oil Corp. Before his transfer to the new Dallas office, Mr. Watson was a sales engineer at Houston.

World Wide Operations

Worthington Corporation's overseas facilities, consisting of a network of over 125 distributors throughout the world and 11 manufacturing plants located in 10 countries, are described in a bulletin entitled "World Wide Operations—Worthington." This 16-page booklet will be distributed both abroad and domestically. Copies are available from Export Account Supervisor, Advertising and Sales Promotion Department, Worthington Corporation, Harrison, New Jersey.

Contract Awarded for Strategic Alaskan Line

(Continued from page 55)

lain with silt of varying depth, but there are many areas of swamp or tundra and some solid rock. Permanently frozen ground can be expected at varying depths along the route."

The new venture recalls the wartime Canol pipe line project which, however, was markedly different. Basic aim of the wartime project, which cost $150 to $200 million, was to tap a crude oil supply in the frozen north, near the Arctic Circle at Norman Wells, Canada.

The greater part of the Canol line was laid through a wilderness, but later the line was taken up and sold for its salvage value. A refinery built at Whitehorse, Alaska to process the crude was sold for salvage and transported to Edmonton, Alberta.

One part of the Canol project, however—a line from Skagway, Alaska, near Haines, to Whitehorse and on to Fairbanks—is in use today, transporting aircraft fuels to military bases. The line, of 2.5 and 3 inches, is regarded as too small to meet full military needs, but the plan is to keep it in service.

The construction go-ahead, coming on the eve of winter, is expected to be answered at once by the Williams Company in the face of the 22-month deadline. While actual trenching may be difficult, pipe can be delivered and laid along the route against the coming of spring when it can be buried.

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600 v. switch fuse unit with terminal box.

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SPECIAL PURPOSE

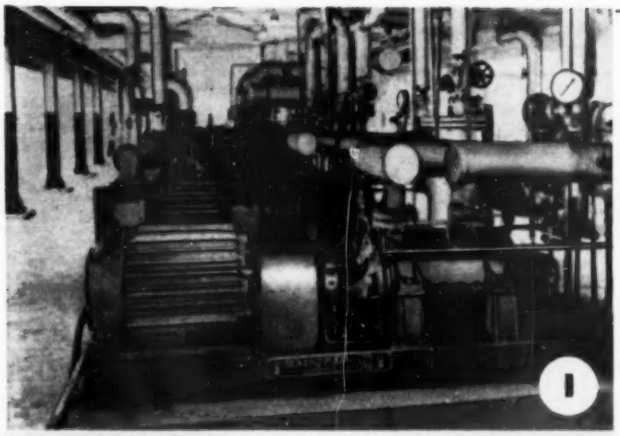
Nuts, Bolts and all-thread Studs from special creep-resisting alloy steel, supplied in fully heat-treated condition within the 55-65 ton tensile range.

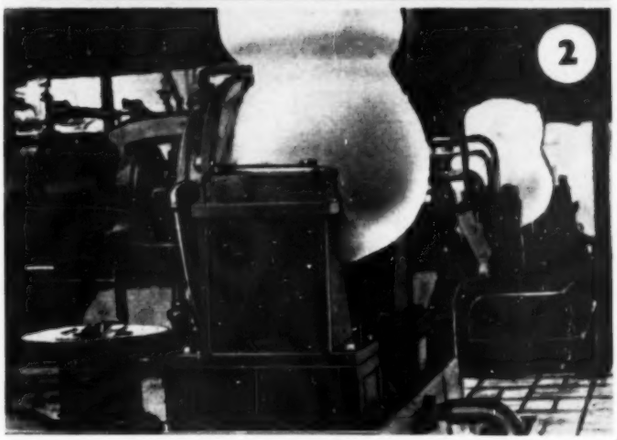
Studs are B.S.970/1947 EN19A (comparable to American ASTM 193-4 (t) Class B7 and B.S.S.1750-1951.

Nuts are Hot Forged and can be supplied to full Whitworth or American Heavy Standard sizes and heat-treated to ASTM 194-46 Class 2 or 2H and B.S.S.1750-1951.

Studs and nuts screwed to Unified, American, British Standard Whitworth Thread and British Standard Fine Thread, according to customers requirements.

CHARLES RICHARDS & SONS LTD., DARLASTON, near WEDNESBURY.





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2. *Single-stage HO-N pumps used in sub-zero duties (32°D.) in a de-waxing unit.*

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PHOSPHOR BRONZE
GUNMETAL
GREY & ALLOY CAST IRON

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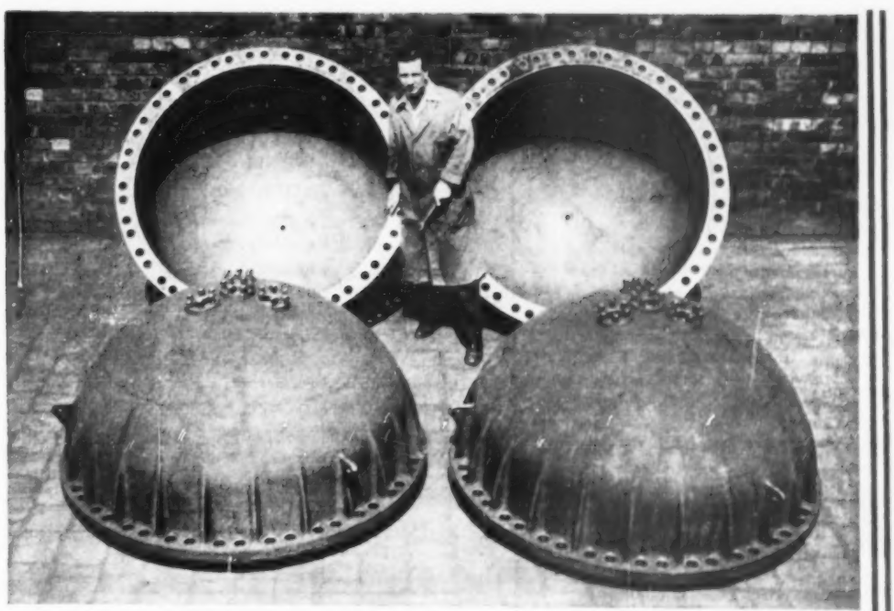

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Executive with gas marketing experience wanted for presidency of proposed Canadian company which will hold large proven gas reserves. Will live in or near Calgary. Submit detailed account of educational background and experience. Inquiries kept confidential. Write Box 107, WORLD PETROLEUM, 604 Fifth Ave., New York City 20.

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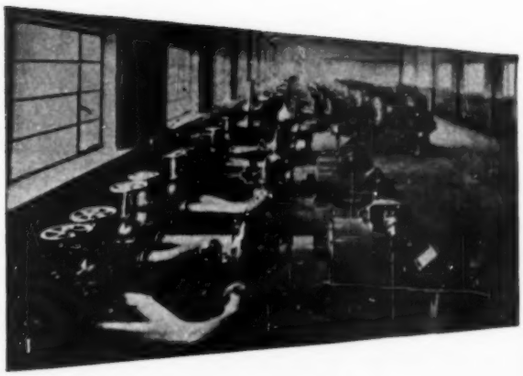
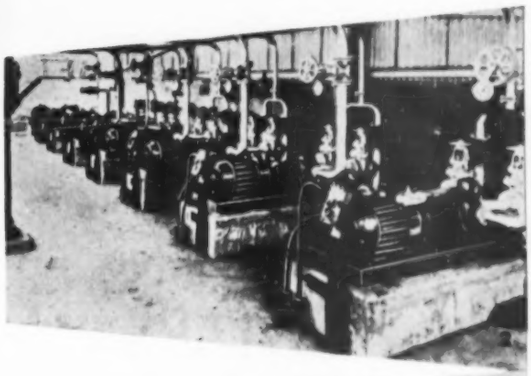
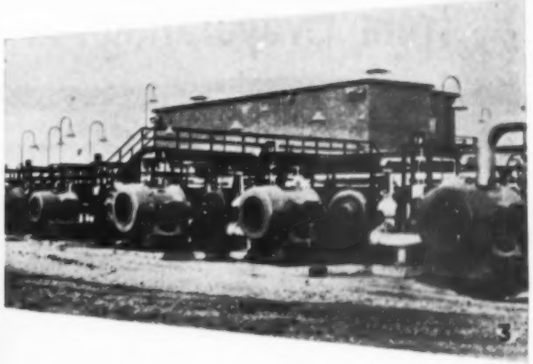
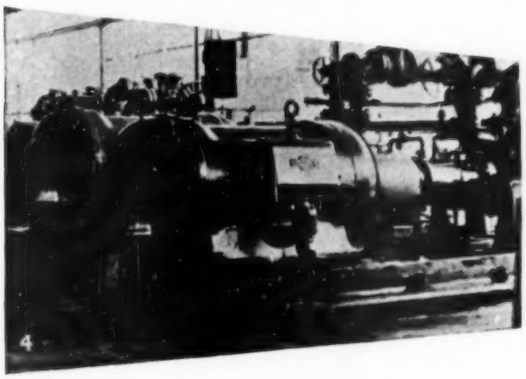


A complete range of Metrovick Buxton-certified flameproof motors is available for refineries and petro-chemical works, for either indoor or outdoor use. Machines with either ball and roller bearings, or sleeve bearings, can be supplied, and all are suitable for hot product pumps.

A specialised range of splash-proof well-pump motors and industrial type machines for non-hazardous locations is also available.







1. A range of flameproof motors in one of the main pumping stations at Scottish Oils, Grangemouth Refinery. 2. Type KFB flameproof motors driving Sigmund pumps at Shell Stanlow Refinery. 3. 300-600 hp outdoor flameproof motors at the product loading station at Esso Refinery, Fawley. 4. 125 hp 3500 rpm T.E.F.C. motors driving oil pumps at Trinidad Leaseholds Pointe-a-Pierre Refinery, British West Indies.

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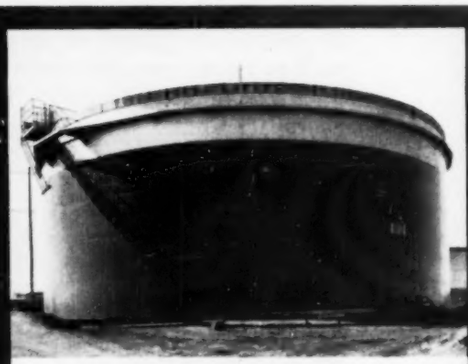
Storage of crude oil and other hydrocarbons can be costly unless properly handled. Dollars can evaporate into the air. Throughout the petroleum industry today, storage tanks equipped with Horton® Floating Roofs are reducing evaporation loss, corrosion and fire hazard.

Horton Floating Roofs are built in three styles: Double-Deck, Pontoon and Pan. All three float directly on the surface with the entire bottom of the roof normally in contact with the liquid in the tank. There is no space above the liquid for an air-vapor mixture to form, be vented and—evaporate your dollars away. Fire hazard and corrosion are also reduced as a direct result of the elimination of the vapor space.

Horton Floating Roofs have been approved by Underwriters Laboratories, Inc. Write our nearest office for a copy of their report. We will also be glad to supply further information, estimates or quotations on the Horton Floating Roof most suitable to your operation. There is no obligation on your part.



HORTON SEAL

Note the seal extending above the top of the tank in the view above. It is still working efficiently preventing the loss of vapor . . . and allowing the full capacity of the tank to be used.

The Horton Seal is standard construction on all Horton Floating Roofs. Vertical flexures every 22 inches allow the ring to expand and contract enough to conform to the inside of the tank shell. Pantagraph hangers that support the ring apply a gentle, even, outward pressure and also keep the roof centered at all times. A gastight, weatherproof flexible fabric closes the space between the top of the sealing ring and the deck of the roof making the space in the seal vapor-tight.

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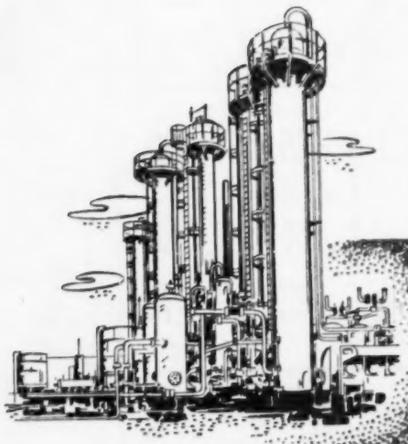

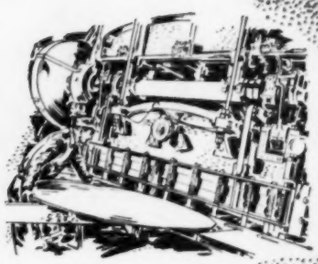

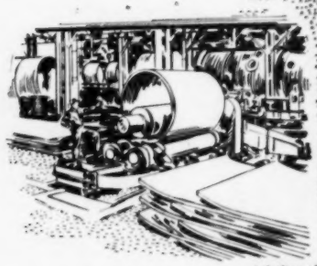

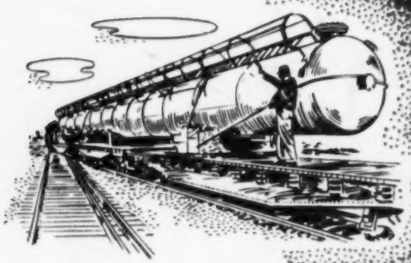

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